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Fractures In The Aged

LOUIS W. BRECK, M. D.
El Paso, Texas

INTRODUCTION

IN the past the treatment of fractures in old people has not been given as much attention as now, probably largely because of the many difficulties which the subject has presented. While some fractures were treated adequately the surgeon was prone to say "the patient only has a very short time to live anyway so we'll just leave him alone and make him as comfortable as possible." What he really meant was that there was no use worrying about the patient anyway as he was going to die soon, and thus sub-consciously the surgeon tried to forget the patient as quickly as possible. It has been the practice in these cases to give the patient narcotics and sedatives and treat the fracture with the most superficial type of treatment or even with no treatment at all.

The attitude of doing as little as possible was somewhat excusable some years ago but certainly cannot be countenanced now because of two very good reasons. In the first place old people live much longer now than they did formerly and do very much better. There has been a great increase in the span of life and old people both live longer and enjoy life much more than in times past. In the second place newer methods of treatment of fractures have in many instances made it possible for fractures in old people to be treated much more satisfactorily with less shock, less morbidity and with better end results.

There is really nothing more deplorable than the picture of an aged person with an ununited or malunited major fracture who is in constant discomfort and often in real agony every time he uses his extremity. This has been a common sight in the past, and since extensive reconstructive surgery in the aged is usually quite dangerous and not advisable because of the shock and blood loss attendant upon such procedures, these miserable old people have been doomed to a life of continuous pain. Fortunately such an eventuality can usually be prevented now by appropriate treatment and the patient restored to complete freedom from pain or to a reasonable degree of comfort at least.

Recently a great deal has been written on the subject of the care of the aged in general and a new speciality has been created called Geriatrics. It is not the author's purpose to go into the medical side of this problem in any detail for there are many good articles and symposia in the literature on the subject. These old people do present special problems, however, and the realization of this must be borne in mind. The purpose of this paper is rather to emphasize the importance of making a serious effort to treat the aged patient with a fracture, in every case where it is at all possible.

INDICATIONS AND CONTRA-INDICATIONS FOR TREATMENT

When an old person presents himself with a fracture the most important thing to do is to evaluate his general condition. When he is first seen one should make him as comfortable as possible temporarily and institute measures to relieve shock if an appreciable amount of shock is present. In evaluating the patient's general condition particular attention should be paid to the patient's heart, blood pressure, lungs, and his urinalysis. One other point of particular importance is the patient's general vitality. Such physical ailments as a moderate degree of senile psychosis, slight incontinence of urine without significant urinary findings, hemorrhoids, dyspepsia, and the like must be

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Figure 1. A 93 year old woman who had a fracture of the neck of the femur which was nailed with the blind nailing technique. Patient had a very satisfactory end result.

Figure 2. A 70 year old man with a fracture of the hip and a severe grade of myelogenous leukemia. Treated with blind nailing with a Smith-Petersen nail and a Thornton angle bar with an excellent end result.

considered but are not important determining factors in whether or not surgery (either opened or closed) should be done. One should be on the look out for other rarer serious complicating lesions such as the presence of a cancer. The patient's regular general practitioner can usually be of great help in evaluating his general condition. However, it is surprising how often one sees an old person who has not had a doctor for some years and if this happens to be the case the important help from the patient's family physician is lacking.

The decision as to whether or not to go ahead with appropriate definitive treatment really resolves itself into answering this question: Is the patient almost certainly going to die in the very near future regardless of what is done? If the answer to this question is yes, simple palliative treatment may be persisted in and the patient simply made as comfortable as possible. The fracture is either not treated at all or a simple dressing or traction applied. Examples of this are found in a fracture of the hip in which simple adhesive traction is placed on the leg in the form of Buck's extension or in a fracture of the neck of the humerus in which the arm is simply bound to the side without reducing the fracture. If the answer to the above question is no (that is the patient will probably live for at least a while and perhaps indefinitely) the most satisfactory method of treating the fracture which is feasible should be selected and instituted immediately.

Occasionally a patient is encountered who was thought hopeless at first and yet who looks so much better after a week or two in bed that it looks as though he is going to live on indefinitely. In a case of this kind the surgeon should not hesitate to change his mind and abandon the palliative treatment previously instituted and go ahead with suitable definitive treatment. However, I wish to emphasize that this does not affect what was said just previously about the importance of operating (or otherwise treating) the better risks immediately after the fracture occurs, preferably within the first day or two. The reason for this is very important. If we have an old person who is only a fair risk anyway, yet who is capable of withstanding a satisfactory method of treatment, and we keep him waiting several days lying on his back and suffering he will in all probability be a worse risk after a few days than he was to start with.

The selection of those cases suitable for treatment requires a great deal of judgment. Often a low grade heart disease or a not too high hypertension will permit the patient several years of life and the surgeon should go ahead and treat the fracture so that these remaining

years of life may be as comfortable as possible. It is felt, generally speaking, that the surgeon should err on the side of treating as many cases definitively as he possibly can rather than hesitating in the doubtful cases. This attitude is taken in the hope of preventing that deplorable picture of the aged person doomed to months or years of suffering from an ununited or malunited fracture and whose misery will only be relieved by death. We should realize that old people's bones if given a reasonable chance will unite as well or nearly as well as those of younger individuals. We should also bear in mind that regardless of age we cannot get 100% good results in the treatment of fractures and this applies equally to the aged. Persons of advanced age are as entitled to adequate treatment as anyone else.

PRINCIPLES OF TREATMENT

Probably the most important thing in connection with the treatment of these patients has already been mentioned and that is that treatment should be instituted as early as possible. This should be re-emphasized again for the reasons given in the preceding discussion.

Another thing to be borne in mind is that the least shocking procedure available should be used consistent with a high percentage of good results. Closed methods are much to be preferred over open methods where the percentage of anticipated good results is anywhere near the same with the two methods. Open operative proceedures are often essential and indicated in certain types of fractures where the operative method is really the most conservative. An example of this is a fracture of the neck of the femur where by means of blind nailing a very satisfactory method of treatment is available. The risk is slight because of the very small amount of shock attendant upon the procedure and the blood loss is very small because of the type of incision used. Another example of desirable open surgery is the removal of a badly fractured patella. This procedure is relatively simple and if done under a tourniquet the risk is extmerely slight. One must weigh all the factors together in deciding what type of treatment to use in a specific case. In evaluating the probabilities of a good result from a method treatment the surgeon should not think back on one or two cases which he has had himself that turned out well but should be guided by statistics in the literature or in reliable text books based on a large series of cases. In evaluating good results in old people the criteria are slightly different than in younger individuals. In an old person absence of pain following recovery is an important factor in deciding whether a result has been good or not, whereas range of motion may not be nearly so important, since the patient does not have any more work to do with the extremity during the remainder of his life.

Figure 3. An 85 year old woman with a fracture of the shaft of the humerus treated with a closed reduction and cast. Photograph shows range of motion after four months.

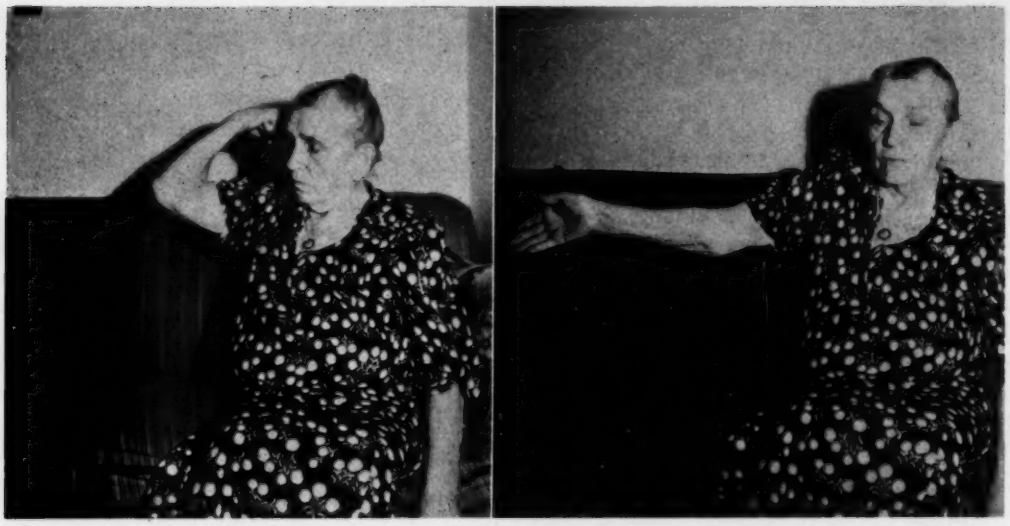

Figure 4. An 82 year old woman with a supracondylar fracture of the humerus treated with a closed reduction and posterior moulded splint. Photograph shows range of motion after four months.

Anaesthesia should be used as sparingly as possible and ether avoided. This is not the place to enter into a detailed discussion of anaesthesia in general and the merits of various types. The author personally has had good success in the aged with local anaesthesia, spinal anaesthesia, consisting of novocaine crystals disolved in spinal fluid, and cyclopropane gas.

The patient should be set up in bed by the end of the day of operation and every day thereafter. This is a very important point and cannot be over-emphasized. Lying flat in bed causes the development of a varying degree of hypostatic congestion in the lungs with the danger of pneumonia. Another effect of lying flat in bed is that the patient loses strength and becomes used to lying down so that it is very difficult to get him up again.

The early use of the wheel chair is desirable for much the same reasons as given for sitting the patient up in bed. It helps keep the patient's vitality up. He should be placed in a wheel chair as soon after the operation as practicable.

Casts of necessity must frequently be employed but casts should be used as seldom as possible and their size should be kept down to the minimum. A posterior moulded splint envolving as few joints as possible may often be substituted for a big cast. A cast involving one or both hips should not be used in an aged individual if it can possibly be avoided. The reason for this is that they prevent the patient from sitting up and prevent the use of the wheel chair. A cast involving the knee should be avoided when possible because permanent pain and stiffness of the knee joint are often the result.

These patients should be given vitamins routinely. They are probably most easily given as a compound vitamin capsule containing all the vitamins. One of these capsules twice a day is a good dose and it is surprising how often these old people show improvement in their general health during their convalescence, and how often they will be better at the end of their convalescence than they have been in many years. Vitamin C is useful in wound healing. Vitamin B has a very salutary effect on the appetite and general health and vitamin D plays a part in calcium metabolism. The other vitamins are beneficial for their general effect on the patient.

The use of physical therapy is very important. After removal of fixation apparatus aged patients usually have a good deal of stiffness in their joints and the use of heat, especially in the form of short wave diathermy, massage, and active and passive motion is very useful in regaining normal motion. Physical therapy by a trained technician is especially important in the aged, for these old people are often loathe to help themselves.

The general care post-operatively is quite im-

portant and certain general measures should be used. The patient should be supplied with a good adequate diet and should drink at least 3 glasses of milk a day which will supply an adequate calcium intake. Only very rarely is a patient encountered who cannot take this much milk in some form or other and in these rare cases some other form of calcium may be necessary. An especially important and useful thing in connection with the general care is the use of a sheep skin under the patient's buttocks and back for the prevention of decubitus ulcers. One should not end the discussion of the general care of old people without a word about the way they are treated from the psychological standpoint. They require a great deal of encouragement and a serious effort should be made to have some member of the family or some other attendant with the patient almost constantly to give them encouragement and keep their morale up.

In this discussion no attempt has been made to go into detail in regard to any definite methods of treatment of specific fractures but rather an attempt has been made to enumerate principles of treatment which should guide us.

CASE REPORTS

Over a period of 3½ years the author has accumulated a series of 22 patients over 70 years of age treated in private practice and who have been followed through to an end result. In this series of 22 cases there have been no deaths. All of them have been followed at least 9 months and long enough to definitely evaluate the end result. They represent consecutive patients treated by definitive surgical procedures, either open or closed methods. The series does not include any cases in whom only palliative treatment was done. In those in whom only palliative treatment was given there was in general a high mortality, and they have nothing to do with this series, for as stated above all 22 cases were treated definitively.

No attempt will be made to go into each case history completely. The cases will be simply listed with the diagnosis and the result obtained. There were nine fractures of the neck of the femur which were treated operatively. Of these nine cases eight had good union with a good end result. There was one case which was lost track of but which was not doing very well at the time last seen and in whom there may have been a non-union. There was one case of a fracture of the neck of the femur which was first seen three months after the fracture with a non-union. This patient was treated by means of a tibial bone graft to the neck of the femur. The bone graft fractured and another non-union took place. This case is a borderline case as to being an acute fracture and might better be considered an example of reconstructive surgery. There were three cases of intertrochanteric fractures of the femur, treated by con-

Figure 5. A 76 year old woman with a fracture of the outer table of the tibia treated with a closed reduction and cast. Photograph shows range of motion after four months.

servative methods consisting of well leg traction. Good union occured in all three cases. In two of the cases there was a moderate amount of permanent stiffness in the knees and in the others there was no appreciable permanent stiffness. There was one case with a fracture of the shaft of the tibia with marked displacement which was treated by closed reduction and cast and in the same patient a Colles' fracture of the wrist with marked displacement was treated by closed reduction and anterior and posterior moulded splints. Both fractures united promptly and a good end result was obtained in each. There was one case with a fracture of the inferior and superior rami of the pelvis on one side and with three fractured ribs. This patient made an uneventful recovery with good union. There was one case with a supra-condylar fracture of the humerus with displacement which was reduced and held in a posterior moulded splint. A good result was obtained in this case. There was one case with a fracture of the external tibial plafond which was treated by a closed reduction and cast and a good result obtained. [5] There was one case of a long spiral fracture of the shaft of the humerus which was treated by closed reduction and a posterior moulded splint with a good end result. There were three cases of fractures of the neck of the humerus, all three of which were treated by closed reduction and cast with a good result in all three cases. There was one case of a Colles' fracture of the wrist which was treated by closed reduction and cast with a good result. It will be noted that in the 22 consecutive cases there was a mortality rate of 0 and a percentage of good results of approximately 91%.

A few short case reports will be given to illustrate certain points in connection with the treatment of fractures in the aged.

A. M. was a 93 year old woman with an acute fracture of the neck of the femur. [1] She was seen the day of her injury by another surgeon who decided she was going to go ahead and die, but as a last resort the author was called in. Even though the patient was very thin and was lying in bed only partly conscious and moaning with pain, it was found on careful evaluation of the patient that she did not really have any serious organic disease. She was treated by means of a blind nailing operation under local anaesthesia which was performed without incident. It should be emphasized that the blind nailing technique is a pocedure which is not accompanied with much risk for the fracture site and the hip joint itself are not exposed. Instead through a small lateral incision which goes through skin, fat, and fascia, and through only a very insignificant amount of muscle, the area into which the nail is to be inserted is exposed. The guide wire is then placed and its position checked accurately by means of antero-posterior and lateral x-rays. When satisfactory placement of the guide wire has been obtained a cannulated nail is placed over the wire and driven home. The importance of not making a large muscle splitting incision cannot be over emphasized for with a simple lateral incision the shock is slight. No cast is used in these cases post-operatively. The patient under discussion was propped up in bed at an angle of 60 degrees the evening of the day of operation and was up in a wheel chair for an hour twice a day the next day. This prevents the complications attendant upon lying in bed for a prolonged period of time. She had good union and a good result which has been followed for a year and a half.

C. H. was an 86 year old woman with a fracture of the neck of the femur. This patient's fracture was nailed by means of the usual blind nailing technique under a small spinal anaesthetic reinforced with local. She stood the operation very well and was in excellent condition for several days post-operatively. On the sixth post-operative day she began to run a fever and a definite diagnosis of bronchial pneumonia was made which was in all probability contracted from some member of the family. She had been sitting up in bed since the first day, Sulfanilamide was used in the treatment of the pneumonia and the patient was seriously sick for only five days and then recovered. It seems almost unbelievable that a patient with a fractured hip which had been operated on could withstand a post-operative pneumonia beginning on the sixth day so well. She was not critically ill at any time and following her prompt recovery from the pneumonia made an uneventful convalescence. She began walking at the end of 12 weeks at which time the x-ray showed solid bony union.

E. G. was an 85 year old women who sus-

tained a fracture of the shaft of the humerus.[3] The fracture was treated by means of a closed reduction and cast and a satisfactory position obtained. The patient was confined to bed post-operatively although she was allowed to sit up immediately and kept sitting up in bed every day. She had had severe hemorrhoids for several years and the disturbance of having the fracture of the humerus combined with staying in bed aggravated her hemorrhoids and they became exceedingly bad, in fact so bad that it became necessary to treat them surgically. A consultant was called who decided to operate on them and under a low spinal anaesthetic the hemorrhoids were removed 2½ weeks after the patient broke her arm. She withstood the hemorrhoid operation well and by the end of another two weeks was up and around and doing very well. The fracture united solidly by the end of eight weeks and by the end of four months she had a very useful and practically painless extremity. The most interesting thing in connection with this patient is the fact that two years later when the fracture and hemorrhoid operation had long been forgotten she had a cerebral accident which left her with a partial hemiplegia. It is quite interesting that the patient should not have had this while she was under treatment for the fracture or the hemorrhoids.

J. V. was an 80 year old woman. She had a fracture of the neck of the femur which was treated by means of the usual blind nailing operation. She was suffering from a moderately severe senile psychosis before the operation was performed and about ten days post-operatively this began to get much worse. She developed a very severe senile psychosis and was very difficult to manage for a period of about three weeks and then suddenly began to improve and return to about the same condition that she was in before she broke her hip. It is hard to evaluate how much the operation had to do with the senile psychosis as her daughter said she had had several similar attacks of this before her operation. The patient got an excellent result in the fractured hip.

Y. J. was an 82 year old woman who had a supra-condylar fracture of the humerus with marked displacement.[4] The fracture was reduced under light cyclopropane gas anaesthesia and a posterior moulded splint applied. The patient stood the manipultion and cast very well and sat up in bed the evening of the day of the operation and every day thereafter. She was out of bed and around at the end of five days. X-rays showed solid bony union at the end of six weeks. The interesting thing in connection with this patient was that she refused to have either professional physical therapy or any help from any member of her family in limbering up the extremity. The author took a very pessimistic attitude toward the probability of a favorable end result but strangely enough by the end of six months without any physical therapy whatever she had a very useful range of motion with only twenty degrees limitation of extension and twenty degrees limitation of flexion and with a painless elbow. Subsequently motion improved still more.

R. F. G. was a 70 year old man with an intertrochanteric fracture of the femur.[2] This case is interesting because of the severe myelogenous leukemia which the patient had. He did not know he had this disease until he was in the hospital with the broken hip and a blood count was made and it was found he had a white blood count of 294,000. He was treated by another doctor for six weeks in abduction and at the end of this time there was no union whatever at the fracture site. The blind nailing operation was done with the fracture pulled down into as good position as possible before nailing and with a Thornton trochanteric angle bar applied to the nail. Excellent fixation of the fracture was obtained with the nail and bar and no cast was used. At the end of twelve weeks there was a moderate amount of bony union across the fracture site which later became solid. The patient stood the operation very well and did not have any post-operative complications. The myelogenous leukemia was never treated at any time and the patient has never had any symptoms from it.

SUMMARY

Fractures in the aged should not be abandoned except in patients who are very poor risks but instead should be treated definitively by either operative or non-operative means as best suited to the particular case. The more conservative the treatment the better but operative treatment should be used when necessary.

It is of great importance to evaluate the patient from the general standpoint and minor

complications do not contraindicate definitive treatment. Serious heart disease, hypertension or serious renal disease are the chief contraindications for definitive treatment. Treatment should be instituted as early as possible following the occurrence of the fracture.

Other important points in treatment are: the use of local, spinal or cyclopropane gas anaesthesia, sitting the patient up in bed the evening of the day of operation and every day thereafter, the early use of the wheel chair, avoiding the use of casts wherever possible and making the cast as small as possible, giving of vitamins post-operatively and the use of physical therapy.

A series of 22 consecutive patients over 70 years of age which were treated by surgical means (either opened or closed surgery) is presented in which the mortality was 0 and the percentage of good results 91%. Short case reports of several of these cases are given to illustrate certain points in connection with the treatment of fractures in the aged.

Roberts-Banner Bldg.

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Supportive Measures In Care Of Surgical Patients

(Transfusion of Blood and Plasma, Parenteral Administration of Solutions and Stimulants)

THOMAS H. SELDON, M. D.
and
JOHN S. LUNDY, M. D.
Rochester, Minnesota

A knowledge of fluid and electrotype requirements is a valuable aid in the care of surgical patients. The body fluids may be classified as either intracellular or extracellular. The former comprises about 50 per cent of the weight of the body and consists of the fluid within the cells. The extracellular fluid may be subdivided into blood plasma and interstitial fluid. Blood plasma comprises approximately 6 per cent of the weight of the body and interstitial fluid, approximately 15 per cent. The extracellular fluid transports the nutrient and waste products.[4]

GENERAL SUPPORTIVE MEASURES

Before Operation. — Occasionally, patients have secondary anemia. If possible, this condition should be corrected before operation is carried out. Blalock was of the opinion that postoperative pulmonary complications and difficulty in healing of wounds are more likely to occur in anemic patients. Supportive measures, when necessary, should be instituted some hours before operation is performed. If the patient is in fair health and the blood picture, blood pressure and renal functions are within reasonable limits more prolonged preoperative treatment is usually not necessary. The patient, however, should have an uninterrupted sleep the night before operation. This may be procured by the administration of one of the barbiturates, for instance, 1½ grains (0.1 gm.) of pentobarbital sodium before retiring. To allay excitement, this dose may be repeated the following morning. Morphine and atropine also may be administered thirty minutes prior to induction of anesthesia. In some cases preliminary medication may cause marked depression of the systolic blood pressure. Other signs of shock do not necessarily follow this decrease in blood pressure.

Anesthesia.—If a general anesthetic agent is administered in a case in which the systolic blood pressure is depressed as a result of premedication, the blood pressure may decrease to a point where it is not advisable to start the operative procedure. If the blood pressure continues to fall during induction of anesthesia, operation should be postponed until the effect

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of the drug has worn off sufficiently for the blood pressure to return to a satisfactory level.

A spinal anesthetic agent should not be administered to a patient whose systolic blood pressure is 100 mm. of mercury or less, pulse pressure is 20 mm. of mercury or less or the concentration of hemoglobin is 50 per cent of normal or less, nor is it advisable to administer a spinal anesthetic agent if the patient has recently lost weight markedly. If spinal anesthesia is the method of choice, usually 25 mg. of ephedrine hydrochloride is injected intramuscularly at the time the spinal anesthetic procedure is being done. At a certain time after the spinal anesthetic procedure has been completed, the systolic blood pressure may fall due to the effect of the anesthetic agent. Under these circumstances the administration of 25 mg. of ephedrine hydrochloride is repeated, this time using the intravenous route of administration. Some physicians prefer to administer neosynephrin hydrochloride subcutaneously or intramuscularly in doses of from 3 to 5 mg. It seems inadviseable to administer this drug intravenously.

Intravenous anesthesia and rectal avertin[10] anesthesia also may produce cardiovascular depression which requires appropriate and adequate supportive measures.

If stimulants are not available or are undesirable, the patient may be supported by the use of parenteral solutions, such as physiologic saline solution, a 5 per cent solution of dextrose in physiologic saline solution or a 6 per cent solution of acacia in physiologic saline solution.

Fluid for parenteral administration after operation.—If the patient is not dehydrated and fluids are to be given parenterally because they are not allowed by mouth, it is not very important which kind of fluid is administered. Perhaps the best fluid is a 5 per cent solution of dextrose in distilled water. However, if the patient is dehydrated, physiologic solution of sodium chloride is the fluid of choice because of the need for the sodium and chlorine ions. The body, by its natural processes of metabolism, is able to supply all the requirements except the sodium and chlorine ions. If the solution of sodium chloride is supplied and the kidneys are functioning adequately, the fluid will be properly retained, the metabolic process will take place and the extracellular fluid will be restored.[4]

Renal function frequently is disturbed during a period of dehydration. If this has occurred, glucose should be added to the solutions given. Blalock stated that glucose increased the plasma volume and the renal blood flow, and supplied a surplus of water with which the kidneys can perform their functions. Glucose also aids in the oxidation of ketone acids. Saline solutions sometimes cause edema, whereas solutions of glucose usually are not associated with this occurrence.

If the concentration of serum proteins is reduced and large quantities of saline solution are given intravenously, general edema may occur. If the saline solution is administered by any other route its absorption usually is regulated considerably better and this complication is much less likely to occrr. It must be remembered with regard to the administration of large quantities of any crystalloid solution that if the capillaries are damaged, fairly large portions of the solution will escape from the capillaries and will carry more plasma protein with it. The picture is entirely different if the capillaries are not damaged.

SHOCK

Primary shock has been interpreted by many workers as analogous to syncope, and prompt recovery usually can be expected. Secondary shock is a circulatory deficiency, neither vasomotor nor cardiac in origin; it is characterized by a decreased cardiac output, decreased blood volume and hemoconcentration.[23] The most important abnormality in secondary shock is the decrease of the volume of circulating blood. The volume of blood then must be supplemented by the introduction of fluids, such as whole citrated blood, blood plasma or serum, or solutions of crystalloids. Solutions of crystalloids are much more effective in the prevention than in the treatment of secondary shock. Blalock and co-workers[1, 2, 3, 5, 6] stated that it was found that the intravenous introduction of large quantities of those solutions may result in harm rather than in good. Crystalloids are of most importance when the patient is dehydrated severely or when the acid base balance is disturbed. If severe trauma has occurred, secondary shock may be impending or present before the blood pressure decreases. However, impending shock could be demonstrated if it were possible to carry out tests to determine hemo-

concentration. Hemoconcentration is attributed to the loss of plasma from the blood through the walls of the capillaries which have become more permeable. For a time, peripheral vasoconstriction will maintain the blood pressure, but a point is reached at which this mechanism fails and the blood pressure decreases. In these circumstances Blalock stated that solutions of crystalloids do more harm than good by (1) diluting the existing plasma and (2) losing fluid by having it pass through the walls of the capillaries because of the increased permeability.

TREATMENT OF VARIOUS CONDITIONS ACCOMPANIED BY SHOCK

In case of severe hemorrhage followed by shock, the loss of circulating erythrocytes is a minor secondary factor if the proper volume of circulating blood is maintained. Death accompanying or following acute hemorrhage is not due so much to the loss of erythrocytes as to the inadequate circulation, anoxemia of tissues, and increased permeability of capillaries; the whole results in shock attributed to loss of circulating fluid.[17]

Sudden massive hemorrhages, which occasionally occur in cases of ulcers, severe trauma and so forth, may produce oligemia and primary shock. The chief need in these instances is to replace fluid in order to maintain the volume of the circulating blood. The composition of the fluid employed in cases of primary shock is not as important as it is in cases of secondary shock. Hoitink demonstrated in primary shock that a 0.9 per cent solution of sodium chloride was as good as any other blood substitute.[15] However, secondary shock subsequent to severe hemorrhage necessitates the addition of a more permanent fluid because of the loss of plasma through the increased permeability of the walls of the capillaries. Whole citrated blood if available seems to be the ideal agent for transfusion in these cases.

In cases of severe hemorrhage and secondary shock plasma or serum may be used to advantage as its nature is similar to that of the fluid within the vessels themselves.[17, 28, 29] The osmotic pressure of blood plasma is such that it will tend to draw fluid from the tissues back into the veins and thus maintain the volume of the circulating blood within a safe range.

Johnson and Blalock found that volume for volume, loss of blood plasma over several hours was not tolerated as well as loss of whole blood. With the loss of blood plasma hemoconcentration occurs. If a transfusion of whole citrated blood is given then hemoconcentration is not decreased greatly. An ideal fluid under these circumstances would seem to be blood plasma.

In cases of hypoproteinemia, in which incised wounds heal poorly, small transfusions of blood plasma repeated over long periods appear more efficacious than large transfusions given in a shorter period.[25] Minot and Blalock stated that in cases of severe burns transfusion of blood plasma probably is the method of choice for restoration of plasma volume.

TRANSFUSION FLUIDS AND TREATMENT OF REACTIONS

At the Mayo Clinic, a supply of chilled blood is maintained, which, although minimal, is adequate for an overnight's requirement. The supply is replenished daily, and in this way the chilled blood does not become too many days old. We began to use chilled blood at the Mayo Clinic in 1935;[19] since that time, the percentage of transfusions in which chilled blood has been employed has increased gradually. During 1940 it was found that the incidence of reaction to chilled blood was slightly less than that attributed to fresh blood.[20] In most cases, the use of chilled blood gives results comparable to those from fresh blood, but in some cases it may be of less value than fresh blood because of loss of leukocytes, platelets and deficiency in prothrombin.[7, 24, 31]

DeGowin and Hardin demonstrated that the administration of refrigerated blood that has not been warmed is not necessarily followed by more untoward reactions than chilled blood that has been warmed slightly prior to its administration. However, at the clinic it has been the custom to remove the chill from the blood by either immersing the container of blood in a bath of warm water or using a metal heater which surrounds the tubing which carries the blood to the patient.[27]

Codeine phosphate administered intravenously is valuable in relieving in whole or in part the symptoms accompanying a transfusion reaction. As soon as a chill, pain in the lumbar region or other symptoms are complained of, ½ to 1 grain (0.032 to 0.065 gm.) of codeine

phosphate is administered slowly by the intravenous route. The symptoms of the reaction usually will be relieved. Occasionally, 1½ grains (0.1 gm.) are used. If a patient has given a history of previous reaction to transfusion, two doses of 1½ grains (0.1 gm.) each of pentobarbital sodium are given orally three hours and half an hour, respectively, before the transfusion is started, and ½ grain (0.032 gm.) of codeine phosphate is administered intravenously immediately before the blood transfusion is started. In this way, the patient usually will tolerate the transfusion without any symptoms of untoward reaction.

Blood plasma is procured by the separation of blood cells from whole citrated blood. The supernatant fluid is withdrawn after the blood has been centrifuged or has stood for several days. Blood plasma, irrespective of the donor's blood group, may be given.[28] Pooled plasma seems to be advantageous, as the pooling of plasma from different donors of different blood groups seems to suppress the iso-agglutinins. Blood plasma is stored easily, transported readily and apparently is not harmed by repeated shaking of the bottles. It also may be dried, powdered and redissolved in sterile, distilled water and transfused.[11, 12, 13] Apparently good results follow its use.

The separation of supernatant blood plasma leaves a potentially valuable layer of cells at the bottom of the flask. Robertson described a method for preserving suspended erythrocytes in a 2.5 per cent solution of gelatin in saline solution. These transfusions of erythrocytes were used in cases of anemia.

At the clinic, it has been found that a solution which is 3.6 per cent glucose and 2.5 per cent sodium citrate added to the cells from 500 c. c. of whole citrated blood renders a suspension of blood cells that may be used with therapeutic value in cases of anemia.[14] Patients who have secondary anemia require primarily erythrocytes and not blood plasma. In some cases, blood cells have been used which had been suspended for several days. Our best results were obtained if the cells were transfused reasonably soon after separation from the blood plasma. However, the cells remained in fairly good condition up to seven days. Laboratory and clinical data demonstrated that an increase of about 500,000 erythrocytes per cubic millimeter and 5 to 15 per cent increase in concentration of hemoglobin could be expected in the circulating blood. No great change in blood pressure or temperature was noted. Only one severe reaction occurred in a series of seventeen cases. In this case the cells were suspended in the aforementioned glucose citrate solution and stored for two weeks before being transfused.

Castellanos reported a series of cases in which he used transfusions of freshly drawn erythrocytes only. He never encountered any kind of reaction such as fever, chills, vomiting and so forth. He also reported a decreased respiratory rate and pulse rate and a markedly greater pulse pressure. MacQuaide and Mollison added the cells from two bottles containing 500 c. c. of citrated blood and obtained proportionately better results than from transfusions of erythrocytes from one 500 c. c. bottle of blood.

Technic in intravenous administration of fluids.—In the operating room, we usually use a 15 gauge Lewisohn needle with which to administer the blood or other fluids intravenously. In an emergency, if blood is needed in a great hurry, this large sized needle will allow the administration of 500 c.c. of citrated blood in approximately five minutes. However, in the average case this is too rapid; usually, thirty to forty-five minutes are allowed for administration of 500 c.c. of blood. The containers which hold the blood always are hung rather high on the standards and the rate of drip is regulated by means of a stopcock.

If the veins of a patient are small or hard to locate, hot compresses applied to the arm from the finger tips to above the elbows, and from the toes to above the knees frequently will dilate the veins sufficiently to allow the entrance of a needle.[18, 30] If hot compresses have been applied to the arms and legs and the veins have become filled with blood, it is well to use warm alcohol on the skin as the antiseptic solution rather than cold alcohol. The application of cold alcohol in these circumstances will contract the vessels immediately and the benefit of the heat will be lost.

In cases of edema, after the tourniquet has been applied, the edema fluid can be squeezed

sufficiently from the back of the hand and foot to permit visualization of the vein and introduction of the needle into the vein. This introduction must be carried out quickly, as the fluid rapidly re-enters the region from which it was squeezed.

The tourniquet always should be applied as near the site of venipuncture as possible. It acts not only as a tourniquet but also as an anchor to hold the vein which is being stretched for venipuncture. After the bevel of the needle has been buried in the skin, suction can be applied on the plunger of the syringe; the same hand that is holding the syringe and introducing the needle is used for this. This constant suction of the plunger will permit flow of blood into the syringe as soon as the bevel of the needle enters the lumen of the blood vessel. This is particularly useful, as it not only indicates the immediate time when the needle is within a vessel, but it also leaves the physician's other hand free to keep the skin constantly on stretch and thus to keep the vein in a straight line.

SUMMARY

General supportive measures in the care of surgical patients should begin before operation. The patient should have proper fluid balance; adequate premedication is important. Proper supportive treatment during surgical procedures should be instituted, if warranted.

Primary shock usually can be combatted by administration of certain vasopressor drugs or intravenous fluids or both. In secondary shock, the addition of fluids to replace those lost by the increased permeability of the capillary walls is the proper manner of treatment. In cases of severe hemorrhage, whole citrated blood is warranted but blood plasma or serum may be used to great advantage. Postoperatively, the addition of sufficient water, sodium and chlorine ions and glucose to offset fluid lost and excreted is important.

The Mayo Clinic.

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Sarcoma Of The Pancreas

HARLAN SHOEMAKER, M. D.,
Los Angeles, California

SARCOMA of the pancreas is a rare tumor. In 1922 Hyman Goldstein stated that he was able to find 19 accepted and authenticated cases of primary sarcoma of the pancreas. Oberling and Guerin reported a total of 50 cases collected from the literature in 1931. The Quarterly Cumulative Index has contained on the average of one case report a year entitled sarcoma of the pancreas, since 1922. In the literature only two of the titles are found in the American, one in the British, and the rest in the French, German and Italian.

The first generally accepted case of primary sarcoma of the pancreas was reported in 1888 by Litten. The patient was a four year old boy, and the diagnosis was lymphosarcoma.

Sarcoma involving the pancreas, either by metastasis or by extension from surrounding structures, although slightly more common than primary tumors, is also rather rare. Goldstein reported five cases of secondary involvement of the pancreas and one of primary involvement. The first case of secondary sarcoma of the pancreas was reported by Chiari in 1882. The patient was 43 and the primary tumor was a brownish tumor in the left eye. The pancreatic metastasis was "globular, soft, fragile, brownish-black, within a two mm. thick capsule through which the tumor mass protruded here and there."

Sarcoma may rise from the reticuloendothelial tissue of the gland, the stroma, or the peripancreatic lymph nodes, or possibly from an anlage of the suprarenals at a primary site near their embryonal origin. This latter tumor metastasizes to the brain. It should show Kuster's rosettes. If stoma and lumen formation are noted, the tumor is epiblastic. Foot, Carter and Flipse report such a case.

Between the carcinomas and the sarcomas of the pancreas there is an ill-defined group of tumors called sarcomas, in which epithelial and stromal elements participate in producing the malignant tumor.

There are more than 153 incidences of carcino-sarcoma reported in the American Journal of Cancer, July, 1938. Vol. III, Saphir and Vass.

The frequency of sarcoma in two series of autopsies here noted is as follows: (1) by Gruber, who did not find one sarcoma in 20,302 bodies. (2) another by Sergre, in 11,492 autopsies found 132 neoplasms, of which 2 were sarcomas. Sergre classifies sarcoma as round cell, giant cell, and spindle cell, as reported by Osterlin (American Journal of Medical Science, new series, vol. 137, 1935).

A review of histopathology of 235 tumors of the upper abdomen, at the Los Angeles General Hospital, shows that seven of these cases approach nearest to the subject of this paper—sarcoma of the pancreas.

Five of these cases are unqualified sarcomas of the pancreas, although perhaps one which is a melanoma, could not be primary in this gland, especially with a history of eye disease, glaucoma. The four primary and one melanoma here reported are classed as reticulum cell sarcomas. The type of cell appears in the autopsy report.

The remaining two of these selected tumors were diagnosed as carcinomas at autopsy, but here the metastases which were biopsied one to two years before death, were unqualifiedly diagnosed reticulum cell sarcomas. That is, these metastatic tumors were thought to have originated in the reticulo endothelial structure of the gland, or the pancreatic lympl nodes, and to have invaded the pancreas before making their appearance elsewhere.

As to age, 45 to 55 years seems to be the time of lessened resistance to tumor incidence in the body, and no exception is noted in these cases. Sarcomas have been reported in children, but the majority of the cases are in adults. Of the seven cases here treated, six were males and one female, and all were white and married.

SYMPTOMS AND DIAGNOSIS

The symptomatology of pancreatic disease, or tumors of the pancreas, in these cases is rather a definite pattern, and once you accustom yourself to the association of symptoms, you should more frequently think of the pancreas and less

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often make a diagnosis of liver or gallbladder pathology.

As in most abdominal diseases, the onset is insidious. At first an allergy to some food, then indigestion and nausea, and finally vomiting. The latter is the first major symptom to present itself. It becomes obstinate and continuous. If there is any one symptom which might be pointed out as pathognomonic, it is obstinate vomiting. This symptom is frequently present in other diseases of the pancreas.

Pain certainly follows closely upon nausea and vomiting, due perhaps to the expanding capsule of the pancreas, or involvement of the extra hepatic or pancreatic ducts, or perhaps to a mild pancreatitis accompanying the infiltration of the gland by a new growth. For the most part the pain is localized in the epigastrium, however the right upper quadrant shares this location of pancreatic pain. The pain is of a deep burning character and not relieved by large doses of morphine, or it may be described by the patient as cramp-like.

Jaundice will be a late symptom. If seen early the very light shade of icterus is not readily distinguished from a hemolytic jaundice. As the tumefaction progresses in the pancreas, the depth of the skin discoloration is adequately described as bronzing. All jaundice is accompanied by skin stimulation. Pancreatic jaundice is no different. In the late stages pruritis is intense.

A disturbance in the digestion of fats and carbohydrates may be accurately determined by the amount of lipase or amylase in the blood. The proteids or nitrogen content of the blood is more complex. Quick's hippuric acid test for liver function, or the non-protein nitrogen found in the blood, will aid materially in determining some of the breakdowns of proteins. A more ultra-scientific method of their analysis has been brought forth by Tiselius in his electrophoretic reaction of proteins.

The pancreas is the principal factor in the alteration of all food substances, by aid of various catalyzers, such as the acid of the stomach and the bile of the liver. Consequently in a thorough survey of any abnormalities of digestion, the pathology of the pancreas must not be overlooked, especially in the presence of any upper abdominal disease.

A contrasting feature of sarcoma to carcinoma, is the rapid growth of the sarcomatous tumor. True we have no control factors to verify this rule of growth, and this may be only an impression. However only a cyst of the pancreas seems to compete with a sarcoma in rate of growth in my experience. The smooth outline of the former should aid in differentiating the cyst from the more nodular tumor.

In one of the cases here reported, the tumor reached a size of 15 pounds. These tumors fill the epigastrium and are frequently thought to be in the liver.

The presence of (1) an upper abdominal tumor, a disturbance of (2) the sugar, or, (3) calcium levels in the blood, alteration in (4) fat and (5) starch ferments, and possible (6) nitrogen imbalance, also (7) a high red blood cell count, and (8) hemoglobin estimation with (9) an abnormally high leucocyte count above that usually found in malignancy, accompanied by (10) obstinate vomiting, make a complete syndrome of pancreatic symptoms.

One case of sarcoma of the pancreas died in tetany with a very low blood calcium. Also one suffered from diabetes. Blood counts are seldom low, and the white count is unusually high for malignancy, ranging around 20,000 leucocytes.

There is generally speaking, great emaciation of the body, which viewed from the high red cell count, and high hemoglobin estimation, is due most probably to blood concentration from dehydration, but when considered from a clinical angle, undoubtedly has something in common with a loss of the subcutaneous fat of the body.

It is further noted that a low blood sugar is generally present, 75 mg—100 mg. being normal.

Recently a report of a small number of cases of tetany accompanying pancreatitis with hemorrhage, has been made by Dr. Hugh Edmondson. This small series of cases has demonstrated that the fat necrosis accompanying acute pancreatitis liberates sufficient fatty acids and probably ferments — lipase — to absorb the alkaline bases from the blood — calcium, sodium, and potassium. When the calcium level of the blood falls to 6 mg. per 100 cc., muscle cramps and tetany begin. In one case here reported a tetany preceded death. It is interesting to note that here we have a disturbance of the calcium in the blood due to increased lipase

and fatty acids, without a disturbance of the parathyroid glands. Clinicians have long noted the spasm of the muscles in the epigastrium, even in the absence of pain, in upper abdominal disease — a localized tetany.

That an increase or decrease of the insulin in the blood may be affected by pancreatic tumor, is suggested by the fluctuation in the sugar level in the blood in pancreatic disturbances. On the other hand emaciation of the body is a significant symptom of hyper insulin or hypo glycemia.

AUTOPSY FINDINGS

The following autopsy protocols are here presented:

(Case No. 1) Sarcoma of Pancreas. Patient No. 284-520. V. L. M. age 47, female, white, widowed, occupation not recorded. Admitted to hospital February 9, 1939. Died February 9, 1939.

SUMMARY OF CLINICAL HISTORY:

Chronic alcoholic with abstinence for two years. One month ago began to notice dark urine and light stools. Jaundice for past two weeks. Vomiting and fever for one week, with itching of skin for past five days.

Physical Examination: Temp. 101; Pulse 144; Resp. 24; B. P. 170/95. Patient well developed and well nourished. Jaundiced, nervous, tonic contractions of hands, arms and feet (carpo pedal spasm). Pinpoint pupils. Jaws stiff. Chest clear. Abdomen spastic with tenderness on left.

Laboratory: Ca. 7; NPN 68; Creat. 10; van den Bergh 6.3 direct; Ict. Index 64.

Progress: Patient became comatose 4 hours after admission, and died 1 hour later.

AUTOPSY FINDINGS:

External: No abnormalities except small amount of edema of both lower extremities.

C. N. S. and Skull not examined

C. V. System: Pericardial sac contains 10 cc. clear yellow fluid. Moderate degree arteriosclerosis noted in aortic, mitral and pulmonic leaflets. Aorta and medium sized arteries show a mild degree of atheromatous degeneration.

Respiratory System: Lungs present hemorrhagic dark purple mottled appearance. On palpation they are crepitant throughout. Generalized hemorrhagic appearance in both lungs. They appear ragged-like and drip blood stained frothy material. Tracheobronchial lymph nodes show moderate enlargement. They are black and moderately free on palpation.

Digestive System: Mesentery of large and small bowel is slightly edematous. Numerous palpable firm nodules throughout. Peritoneum overlying kidney and area surrounding body and tail of pancreas invaded by firm white confluent tumor. Mucosal surface of jejunum on section shows confluent tumor. Descending colon is firmly attached and partially surrounded by tumor mass. Head of pancreas is firm, hard, and surrounded by large, irregular, nodular tumor mass, which occludes the common duct and extends up to and including the cystic normal lobular architecture of the pancreas can be seen, and in several areas this is invaded and replaced by tumor.

Hepatic System: Liver is attached to diaphragm by numerous avascular adhesions. Liver is green-red in color and firm. Bile ducts are distended and show evidence of extravasation of bile into the liver and is moderately congested. Gallbladder markedly distended, and contains approximately 50-60 c.c. dark green mucoid material. Marked constriction at junction of both hepatic and that part of common duct surrounded by tumor. The lumen at these points is approximately 1mm. in diameter. Moderate dilatation of both hepatics above point of constriction. Some dilatation within liver substance. Portal system grossly normal.

Spleen: Moderate degree of accentuation of trabeculae. Retroperitoneal lymph nodes are invaded and surrounded by tumor. There is a small tumor mass extending from the pelvis upward within the retroperitoneal space to a tumor mass which surrounds the kidney and suprarenal. Neither of these organs appears invaded.

Urinary Tract: Left kidney is completely surrounded by firm white irregular, nodular, infiltrating tumor, approximately 4 cms. thick in all directions. Tumor extends upward to lower attachment of the diaphragm. Tumor encloses the left ureter in its mid-portion. Similar mass but not as large, on right side. Urinary bladder contains approximately 10 cc of brown turbid fluid. Mucosa is moderately injected.

Genital System: There are scattered about the os several white firm nodules which invade the cervix. Uterus slightly enlarged with white nodule extending from the fundus on the left. Numerous avascular adhesions from both tubes to their ovaries. On section ovaries contain several clear fluid cysts and left ovary contains numerous 1mm white, firm masses.

Endocrine System: Pituitary and thymus are not examined. Suprarenal on the left completely surrounded by tumor mass. Apparently gland not invaded. No other abnormalities.

Skeletal and Muscular Systems: No metastases to the vertebrae noted.

ANATOMICAL DIAGNOSIS:

Retroperitoneal lymphosarcoma, reticulum cell type with metastases to: pancreas, peritoneum, jejunum, ovary.

Hydronephrosis, bilateral.
Atherosclerosis, generalized.
Chronic cholecystitis.
Chronic salpingitis.
Nabothian cysts.
Fibromyomata uteri.
Chronic alcoholism (clinical).
Essential hypertension.
Ovarian cysts, retention.
Cardiac hypertrophy, L. V.
Uremia.
Jaundice.
Tumor obstruction of bile ducts.
Tetany (alkalosis).

CAUSE OF DEATH (AUTOPSY):

Retroperitoneal reticulum cell lymphosarcoma with metastases.

Contributary: Chronic alcoholism, bilateral hydronephrosis.

CAUSE OF DEATH (OFFICIAL).

Same.

(Case No. II.) Sarcoma of Pancreas. Patient No. 439-057. J. A. S. age 85, male, white, widowed, occupation not recorded. Admitted to hospital June 14, 1935. Died June 20, 1935.

SUMMARY OF CLINICAL HISTORY:

Past health good. Loss of weight for two months. Complained of nausea for several months, with vomiting past two weeks. Jaundice past two weeks. Jaundice for 4 weeks. Day before entering hospital had excruciating pain upper abdomen which lasted for several hours.

Physical Examination: Temp. 99.8; Pulse 60; Resp. 22: B. P. 120/80. Abdomen extended throughout, marked tenderness. Mass felt in upper abdomen which is firm, smooth and very tender.

Laboratory: Blood Wasserman — negative.

Progress: Downhill course with frequent M. S. for pain. Died 6 days after admission.

AUTOPSY FINDINGS:
(Autopsy Limited to Abdomen)

External: No abnormalities except jaundice and tumor in abdomen.

Peritoneum and Digestive System: Peritoneum over upper abdominal viscera contains small metastatic nodule. Peritoneal cavity contains about 300cc thick bloody fluid. Pylorus and fundal portions markedly thickened. Number of adhesions involving anterior surface of stomach. Nodular mass extends inferior from anterior surface of stomach. Duodenum presents perforation, possibly post mortem. Gastrohepatic omentum densely infiltrated with tumor tissue. Bowel content has typical illuminous sheen characteristic of pancreatic stool.

Hepatic System: Surface of liver slightly nodular. Section reveals accentuated lobular markings are stained dark green in color. Several yellow-white irregular nodules of firm tissues are noted throughout the parenchyma, one being located at the hilus of the liver. Gallbladder and common duct (bile) are dilated.

Skeletal System: No gross abnormalities.

ANATOMICAL DIAGNOSIS:

Retroperitoneal tumor.
Infiltration of pancreas and stomach.
Infiltration of lymph nodes, gastrohepatic omentum.
Infiltration of liver.
Atherosclerosis of aorta, superior mesenteric, etc.

PROBABLE CAUSE OF DEATH

Retroperitoneal reticulum cell lymphosarcoma with infiltration of stomach and pancreas.
Perforated duodenal ulcer.

OFFICIAL CAUSE OF DEATH:

Same.

(Case No. III.) Cyst of Pancreas—Sarcoma. Patient No. 525-386. White, male, 42, married, auto serviceman. Admitted to hospital August 9, 1937. Operated August 14, 1937 (removal pancreatic cyst). Left hospital September 23, 1937.

Readmitted January 7, 1938. Died January 10, 1938.

SUMMARY OF CLINICAL HISTORY:

Patient first entered hospital August 9, 1937 complaining of rapidly growing epigastric mass. Following workup was surgically explored August 14th and large cystic mass was aspirated and biopsied. Laboratory reported fibrosarcoma of low grade malignancy. Patient continued to have some drainage, but general condition improved until 1 week prior to return, when he developed fecal drainage. Two days prior to admission he developed cramping lower abdominal pain, nausea and vomiting. Gives history of recent RX for lues.

Physical Examination: Temp. 100; Pulse 110; Resp. 20; B. P. 130/90. Emaciated, acutely ill. E. N. T. negative. Heart negative. Lungs clear. Abdomen distended. Generalized pressure and rebound tenderness. No rigidity.

Laboratory: Blood WBC 26,000; Polys 94; L. 6; no evidence of blood dyscrasia. Wasserman negative. Spinal fluid: sugar 72 mgs. per 100cc of spinal fluid. NACL—722 mgs. per 100cc of spinal fluid. Total protein .0674 gms. per 100cc of spinal fluid. Urine negative. *Tissue from pancreatic* cyst; diagnosed as fibrosarcoma of low grade malignancy. X-ray of abdomen shows abdominal density, borders not clearly delineated. Origin of mass radiographically undetermined. Pyelography — no abnormality.

Progress: Patient diagnosed inoperable. Palliation only given. Condition gradually more critical and patient died 3 days following admission.

AUTOPSY FINDINGS:

External Abdomen greatly distended with midline draining sinus. Otherwise no gross abnormalities.

Skull and Central Nervous System: No gross abnormalities.

Neck Organs: Not examined.

C. V. System: Position of heart normal. Slight increase in external fat. Chambers moderately dilated and entire heart is very flabby. No abnormalities in valves except mitral. One large vegetation measuring about 1cc in diameter on the left leaflet. The endocardium of left auricle is opaque and moderately thickened. A few small diffuse atheromatous plaques in the aorta. Very little peripheral sclerosis.

Respiratory System: No gross abnormalities except both lower lobes are dark reddish blue in color, much firmer than normal and somewhat nodular. Cut surface is very moist and presents areas of consolidation.

Digestive System: Peritoneum throughout is thick and rough. There are about 1000cc of cloudy fluid in the peritoneal cavity, which is foul. Along the greater curvature of the fundus of the stomach there is a sinus measuring 5mm. in diameter which leads into the tumor which will be described. Pancreas is of normal size and gross appearance. In the gastrocolic omentum there is a very large tumor mass which weighs 15 lbs. Stomach is adherent along the upper margin and the above described sinus leads into the tumor. The transverse colon is otherwise essentially free in the abdomen. Cut surface of tumor shows it to be solid except for the numerous sinuses through the central portion which communicates with the sinus in the stomach and with the sinus through the skin. There is considerable hemorrhage into the tumor. The distal two feet of the ileum are completely gangrenous. The intestine proximal to this point is very much dilated. The main artery leading to the gangrenous area is found to be occluded by an organized thrombus. Appendix, large bowel, and rectum are not abnormal.

Hepatic System: Liver weighs 2600 grams. It is pushed up by the large abdominal tumor. Its external surface is a yellowish gray in color. Cut surface reveals no particular abnormalities. Gall bladder, cystic hepatic and common ducts are normal.

Spleen and Lymphatic System: Spleen weighs 185 grams. It is smooth and quite flabby. Cut surface is darker and more pulpy than normal. No intra-abdominal lymphadenopathy or tumor masses can be found.

Urinary System: Kidneys somewhat more flabby than usual. Quite pale. Over the lower lobe of left kidney there is extensive subcapsular hemorrhage. On cut surface there are numerous firm gray infected areas in the left kidney. Cut surfaces on the right kidney are not abnormal. Cortex is of normal thickness. Pelves, ureters, bladder, normal.

Genital System: No gross abnormalities.

Endocrine System: No gross abnormalities.

Skeletal System: No gross abnormalities.

ANATOMICAL DIAGNOSIS:

Fibromysarcoma, gastrocolic omentum.

Fistula, gastric, through tumor to skin.

Embolism and thrombosis, main branch of superior mesenteric artery.

Gangrene of bowel with generalized peritonitis.

Endocarditis, mitral, acute.

Infraction, renal, left, multiple.

Bronchopneumonia.

Edema, pulmonary.

CAUSE OF DEATH: (Autopsy)

Fibromysarcoma of omentum; gangrene of bowel with generalized peritonitis. Acute endocarditis.

Contributory: Bronchopneumonia.

CAUSE OF DEATH (OFFICIAL):

Same.

(Case No. IV.) Sarcoma of Pancreas. Patient No. 257-402. D. D. age 53, male, white, married, chiropractor. Admitted to hospital December 22, 1932. Left hospital December 30, 1932 (without consent).

Readmitted February 24, 1933. Died March 5, 1933.

SUMMARY OF CLINICAL HISTORY:

Patient entered hospital with history of being well until 4 months ago, when he began to lose his appetite, which has been progressive. Has lost 45 lbs. in weight. Has has occasional attacks of epigastric uneasiness and eructation. February 24 re-entered hospital with history of loss of weight, loss of appetite, diarrhea and dribbling of urine, for 4 months.

Physical Examination: Not acutely ill apparently. Abdomen distended. Nodular mass palpable in R. U. Q. Bladder enlarged to 1 inch below umbilicus. Definite anemia.

Laboratory: Wasserman negative. R. B. C.—2,940,000. W. B. C. — 22,550. Hb—42; P.M.N. 85; Lym. -13; X-ray of stomach -30 with 6-hour gastric residue. Duodenal cap well filled and regular. No definite evidence of organic disturbance. 6-hour retention would appear to be functional. Urinalysis—S. G. 1.008; React.—A 1; Alb. plus; Sugar, 0.

Progress: Patient complained of great deal of pain all over body and was given M. S. for palliation. Gradual decline until death. Temp. 104 at time of death. Probably beginning pneumonia.

AUTOPSY FINDINGS:

External: No abnormalities except small white tumor nodules scattered over the omentum and the peritoneal surface.

C. V. System: Heart valves normal. Myocardium very pale and coronary arteries show atherosclerosis throughout, but no areas of occlusion. Marked atherosclerotic change of entire aorta.

Respiratory System: No abnormalities of pleural cavities. Both lungs show passive congestion and edema throughout with early confluent bronchopneumonia.

Hepatic System: Liver weighs 3100 grams. Over surface of liver are many semi-fluctuant areas measuring 4-5 cm. in diameter. Few small areas of solid tumor. Practically the entire left lobe of the liver is invaded by a tumor mass from the posterior surface. This mass measures 21x17x8 cm. Section through this mass shows it to consist of nodules from 3 - 5 cm. having soft mushy centers, some having a red color, but greater portion of white color. The portion of liver not involved by the tumor appears to be normal. Biliary passages are patent. Common duct not constricted by tumor. Gallbladder not abnormal.

Digestive System: Stomach very markedly dilated and lies inferior and anterior to this mass which is adherent to its lesser curvature. A sloughing mass 5 cm. on lesser curvature was found. This involves area of the pyloric sphincter so that part of the mass is in the stomach and part in the duodenum. The duodenum circles about this mass on its right side and is adherent to it. The remainder of the G. I. tract is normal.

Pancreas: Is on posterior aspect of this tumor mass. It is very difficult to say whether the tumor invaded the panereas, or arises from it.

Spleen: Weighs 140 grams. Cut surface has light red and meaty appearance.

Suprarenals: Normal.

Urinary: Kidneys show no abnormalities. Bladder distended with urine. The mucosa is black-red in color and bladder wall considerably thickened. Prostate shows no gross abnormalities.

PROBABLE CAUSE OF DEATH:

Carcinoma of stomach and pancreas, with point of origin uncertain.

Contributory: Hepatic metastases. Bronchopneumonia.

CAUSE OF DEATH: (Official)

Malignant tumor involving pancreas and stomach; classification and primary site not final.

Contributory: Hepatic metastases. Bronchopneumonia.

(Case No. V.) Metatastic melano Sarcoma of Pancreas. Patient No. 636-788. I. S. age 61, male, white, married, efficiency man.

Admitted November 16, 1938. Died December 11, 1938.

SUMMARY OF CLINICAL HISTORY:

A known diabetic under insulin therapy for many years. Has also had a lot of trouble with right eye. Eye condition diagnosed as glaucoma. Three months previous had thorough ophthalmologic examination and again diagnosed as glaucoma. For past year not feeling well, suffering fatigue, malaise, loss of 30 lbs. weight, occasional night sweats, and vague pains in right chest. Chief complaint on entry was marked weakness. No cough or hemoptysis but in the past few months had some stomach trouble.

Physical Examination: Elderly, pale, emaciated and weak, 61 year old man, in no acute distress. Temp. 96.4; P. 96; Resp. 24; B. P. 120/60; chest emaciated with bilateral intercostal retraction on respiration. Increased tactile fremitus on right superiorly. Decreased resonance over both bases and entire left side, also both apices. Breath sounds decreased on left and increased on right. Many moist rales throughout lungs. Liver palpable four fingerbreadths below right costal margin. Marked clubbing of fingers.

Laboratory: Blood — no record. Urine—Alb. 2 plus; no sugar or acetone. Few white cells and casts. Sedimentation rate 27 mm. X-ray of chest — findings consistent with massive pleural effusion on left. Pulmonary carcinoma and TBC to be ruled out.

Progress: Patient became sicker and weaker. Drowsy much of time and with steadily falling appetite. Became unconscious and died December 11th.

AUTOPSY FINDINGS:

External: Scattered over the chest and abdomen and particularly over the scalp, are several small blue-black raised nevi. Right pupil is larger than the left. A rather dark ulcerated area in the dorsum of the left great toe. Chest markedly emphysematous. Smooth bulging mass in lower abdomen.

C. N. S. and Skull and Neck Organs: Not examined.

C. V. System: Pericardium studded on outer aspect with small bluish-black tumor nodules from 1 to 10 mm in diameter. Pericardial sac contains approximately 30 cc of clear yellowish brown fluid. Heart normal in size and shape and position.

All chambers mildly dilated. Endocardium of left ventricle shows dark brown nodules of tumor tissue. Coronary arteries are very tortuous and show considerable atheromatous degeneration, the walls being thick and rigid, although not calcified. Aorta shows considerable extent of atherosclerosis. Just above the bifurcation there is extensive ulceration with some thrombus formation. Above orifice of right coronary artery is small ulceration. Medium

sized arteries show a moderate degree of sclerosis.

Respiratory System: Visceral and respiratory pleura covered with bluish-black tumor tissue of varying sizes. Many broad tough bands of adhesions between visceral and parietal pleura. 1 liter of dark brown clear fluid, left pleural cavity and 300 cc in right. On palpation a large firm irregular tumor can be felt through both lungs. Most of tumor tissue is pigmented, although some is not. Many nodules broken down and necrotic. Most of bronchi filled with pure pus. Mucosal lining of tracheobronchial tree is red and inflamed. In places bronchi presses on nodules, causing stenosis. All of tracheobronchial lymph nodes are enlarged, firm and extensively involved by malignant metastases.

Digestive System: The peritoneum is covered with blue-black tumor nodules described above in pleura. Omentum is particularly attacked by the process so that it is almost replaced by the tumor mass. Many loops of bowel are adherent together and to other organs. The bladder is greatly distended and tightly adherent to the abdominal wall, and external surface is covered with same type of tumor nodules. Mucosa of the stomach, jejunum, ileum colon and sigmoid, all show tumor nodules. The pancreas is rather atrophic and on section several small black tumor nodules can be seen. These are more abundant in the head of the pancreas. Aside from these nodules the lobular pancreatic architecture appears normal.

Hepatic System: Liver moderately enlarged. Surface covered with raised black metastatic nodules. On section liver found to be filled with same type of tumors. Many of tumors found to be necrotic. Gallbladder is quite large and distended with a greenish black viscid bile. Tumor nodules on surface of gall bladder, and extending to include mucosal surface. Portal system appears normal.

Spleen: Shows metastatic nodules described above. Practically all lymph nodes in abdominal and thoracic cavities show evidence of metastases. Other lymph nodes not examined.

Urinary Tract: Capsule of kidneys thick, tough, fibrous. Perirenal fat as well as medullary portion of each kidney shows black metastatic tumor nodules. Mucosal surface of urinary bladder shows small dark brown nodules of metastic tumor. No evidence of cystitis.

Genital System: The seminal vesicles and vasa deferentia are quite dilated with a thin brownish fluid.

Endocrine System: Both suprarenal are considerably enlarged. Cortex is found to be extensively infiltrated and on the left almost replaced by dark black tumor tissue. Pituitary, thyroid, parathyroids, and thymus not examined.

Skeletal and Muscular Systems: Almost complete replacement of marrow of ribs with melanomatous tissue. The entire vertebral column invaded extensively, also bone marrow of femur.

ANATOMICAL DIAGNOSIS:

Melanoma, malignant, primary site undetermined. Metastic to lungs, liver, spleen, bone marrow, pericardium and endocardium, kidneys, stomach, intestines, skin, peritoneum and omentum, adrenals, lymph glands, gall bladder, urinary bladder, pancreas.

Arteriosclerosis generalized.

Diabetes mellitus (clinical).

Bronchitis, acute, purulent.

Glaucoma (clinical).

CAUSE OF DEATH (AUTOPSY):

Malignant melanoma with generalized metastases.

Contributary: Diabetes mellitus.

CAUSE OF DEATH (OFFICIAL):

Same.

(Case No. VI.) Metastatic Sarcoma, Rib. Patient No. 550-183. H. C. W. Age 53, male, white, married, gold miner.

Admitted to hospital April 19, 1937. Operated May 17, 1937. Laparotomy and biopsy liver. Left hospital June 5, 1937.

Readmitted to hospital June 15, 1937. Died June 16, 1937.

SUMMARY OF CLINICAL HISTORY:

Patient entered hospital first time April 19, 1937 with complaints of dysphagia and pain in right upper quadrant of two to four months' duration. Abdomen explored a month after entry, and no definite pathology save a large liver, discovered. Three weeks after surgery was discharged. After two weeks at home was brought back to hospital in state of shock.

Physical examination: Moribund, emaciated male in shock. Heart regular, tones faint. Blood pressure not obtainable. Lungs — dullness entire right, with diminished breath sounds, rales throughout both lung fields. Abdomen distended. Liver large, firm, lower border below umbilicus.

Laboratory: Blood: red cells 5,500,000; white cells 20,630; polys. 78; blood sugar 87. Biopsy of liver showed no cirrhosis. Biopsy of nodule near 10th rib on left side, diagnosed as sarcoma. X-ray stomach and colon negative. X-ray abdomen: right upper half of abdomen opaque.

Progress: Temperature, pulse, respiration became stertorous; patient incontinent and involuntary and expired about 12 hours after admission.

AUTOPSY FINDINGS:

External: Marked distension of abdomen, otherwise nothing abnormal grossly except edema — right lower extremity.

Skull and Central Nervous System: No gross pathology.

Neck Organs: Not examined.

C. V. System: Pericardial sac contains about 40 cc. clear amber fluid. Heart shows moderate amount edema on epicardial surface. Chambers, valves and septa appear grossly normal, as do coronary arteries and myocardium. Aorta shows moderate amount atherosclerosis which is most prominent in region of arch, and proximal to the bifurcation. Inferior vena cava and common iliac veins present thrombosed structures which practically occlude lumina for distance of about 5 cm.

Entire heart and mediastinum have been shifted approximately 2 - 3 cm. to left.

Respiratory: Left lung lies freely in a pleural cavity which contains about 800 cc. sero-sanguineous fluid. Parietal and visceral pleura of left thorax show multiple small nodules similar to metastatic tumor. Lung freely crepitant to palpation and on section presents few 1 cm. gray tumor like nodules. Right lung is somewhat adherent in isolated areas to its thoracic cavity which contains approximately 2,000 cc. bloody fluid. This lung shows marked atelectasis. Bronchioles of left lung surrounded by gray firm tumor-like tissue. Corresponding lymph nodes all enlarged and on section present evidence of tumor tissue. Pulmonary arteries show small amount thrombosed material.

Digestive System: Entire peritoneal surface shows marked evidence of metastatic tumor most prominent in apposition to the lymph nodes. Stomach firmly adherent along its lesser curvature to large tumor involvement of gastric-hepatic omentum. Small and large intestine shows multiple small metastatic nodules, as does greater omentum. Pancreas average size and head is involved in tumor mass of gastro-hepatic region. The greater mass of this tumor tissue measures approximately 10 cm. On section presents buff-yellow color with no evidence of necrosis.

Hepatic: Liver weighs 3700 grams, is firmly adherent to diaphragm over greater portion of tumor. The anterolateral margins of liver are brown-red and present several nodules of metastatic-like tumor tissue which is continuous with the gastro-hepatic mass previously described. On section the greater portion of the liver is involved in a tumor mass which measures 15x18 cm. in various directions. This mass is similar to that of the gastro-hepatic omentum and shows minimal evidence of necrosis. Gall bladder contains about 30 cc of dark fluid. Bladder wall, extra-hepatic biliary ducts and portal system no gross abnormalities.

Spleen: Weighs 260 grams. On section contains one tumor nodule measuring 1 cm. Lymph nodes of inguinal, periaortic, gastro-hepatic and mediastinal regions are all enlarged and on section show evidence of tumor tissue. The tumor 1 cm over axillary line 10th rib left side thorax.

Urinary: Kidneys: parenchyma appears grossly normal in structure, a few c mm tumor nodules found in each kidney. Pelves and ureters grossly normal.

Genitalia: Grossly normal.

Endocrine: Pituitary small and firm. Thyroid not palpable. Suprarenals both enlarged to about twice normal size, and on section show tumor nodules.

Skeletal: 4th and 5th lumbar and 3rd and 4th thoracic vertebrae show evidence of tumor involvement.

ANATOMIC DIAGNOSIS:

Carcinoma of liver.

Metastases to lungs, pleura, lymph glands, spleen, omentum, peritoneum, kidneys.

Hydrothorax, bilateral.

Atelectasis, right lung.

Thrombosis of inferior vena cava and common iliac veins.

Embolism of pulmonary artery.

CAUSE OF DEATH (AUTOPSY):

Carcinoma of liver with generalized metastases.

Contributory: Hydrothorax and ascites.

CAUSE OF DEATH (OFFICIAL):

Same.

(Case No. VII.) Sarcoma of Left Inguinal Lymph Node. Patient No. 636-344—15840. W. P. White, male, 54, married, "grip."

Admitted December 1, 1938. Operated December 7, 1938. Cholecysteduodenostomy for carcinoma (?) head of pancreas. Mass irremovable, but confined to head and ⅓ body. No biopsy. Experience from hemorrhage bad.

SUMMARY OF CLINICAL HISTORY:

July 1938: complained of pain 6 weeks before admission.

September 1st: stopped work. Pain low right back. Diarrhoea. No vomiting. Jaundice to bronzing degree.

December 7th: surgery as above. Following the jaundice cleared.

January 4th, 1939: deep X-ray: 1,000,000 volts on pancreas.

Patient returned to work as a "grip."

June 1, 1939: low back pain began.

August 19th: lymph node in left groin, freely movable and encapsulated, was removed. Dr. J. W. Budd diagnosed Reticulum cell Sarcoma.

Gross Description: "This specimen consists of an encapsulated nodule 5x2.2x1.9 cm in diameter, removed from left groin. Cut sections show very cellular somewhat opaque-gray tissue with faint opaque-yellow mottling in central part of the mass. Frozen sections show the structure of a reticulum cell sarcoma."

Microscopic Description: "Sections of the nodule show complete replacement of the

normal architecture by rapidly growing neoplastic tissue. Many of the cells are large and have clear cytoplasm and large pale staining multiform nuclei. In parts of the tumor the stroma is very inconspicuous. In other places there are more prominent interlacing fibrous bands."

Diagnosis: "Reticulum cell sarcoma metastatic to inguinal lymph node." J. W. Budd.

Radium applied to groin relieved pain which was intense.

August 21, 1939: G. I. Study was negative.

October 6, 1939: Fluoroscope picked up mass in mediastinum and a Ghon tubercle, left upper lobe.

April 29, 1940: Patient appeared in person on surgical program with me. Then followed raying by Smith, Davis and Emery, individually, and finally a radium pack. The patient felt unable to continue more treatment on account of reaction which he dreaded and suffered from.

November 20, 1940: Patient died.

AUTOPSY FINDINGS: (KOSKY)

Emaciated male, 56 years. No external except ancient right rectus scar.

Heart and great vessels, no marked gross pathology. Fatty and plaques plus one.

Lungs, bilateral hydro thorax and metastases over pleura and mediastinum.

Liver, one metastases — 6 cm subserous.

Cholecystodenostomy 5 cm in diameter and functioning and no metastases in abdomen, stomach, intestines and spleen.

New growth in pancreas compresses left kidney — note surgical origin (head of pancreas).

Adrenals not involved.

Bones, skull and C. N. S. not examined.

Microscopic diagnosis head of pancreas— marked fibroses with scattered atypical islands of epithelium sometimes arranged.

ANATOMICAL DIAGNOSIS:

1. Carcinoma of head of pancreas with regional metastases and metastasis to pleura and liver.
2. Previous well functioning surgical cholecystoduodenostomy.
3. Moderate cachexia.

COMMENT

These seven cases of sarcoma cover a wide field, any one of which is a study in itself. The last two cases reported were diagnosed Reticulum cell Sarcoma from biopsies — one of a rib, and the other from an inguinal lymph node of what was thought to be a metastatic growth. The last case reported is remarkable for the length of time he lived — nearly two years following surgery. Also for the intensity of the pain he suffered.

I have noted a terminal reaction which has not been called to the attention of surgeons generally. That is, the frequent occurrence of metastases to the lungs, particularly after X-ray treatment. In the last case a minimal metastases 5mm on the surface of the liver with a maximum involvement of the pleura, was noted.

As the tumor mass encroaches upon the extra hepatic bile ducts, the condition of the gall bladder becomes a large factor in the surgery of pancreatic tumors, or inflammations, of the head of pancreas. The common duct passes through the head of the pancreas in 90 per cent of the bodies examined. Of necessity there should be jaundice, increase in the size of the liver, and distension of the gall bladder. Perhaps all distended gall bladders should be anastomosed to the duodenum. At least Nature has routed the flow of bile free from the pancreas in 10 per cent of the human race, and an operation to eliminate the obstructed flow of bile, may be an early palliative procedure, until the patient's condition warrants a more radical intervention — if one can be devised — such as Whipple's re-section of the head of the pancreas.

Increased temperature can only be caused by chemical activity. The so-called liver death, which could be provoked by a tumor in the head of the pancreas obstructing the common bile duct, might also originate from obstruction or compression of the arterial supply to the liver, either directly on the arterial trunks, or on its peripheral distribution by back pressure. Obstruction of pancreatic duct or acini, produced one cyst and is also a frequent cause of stone formation in the ducts.

With a change in the hydrogen ion concentration, anything may happen. Lester King, writing on vital staining of the connective tissue, noted that the thalmus was stained a deep red by the dye used — phenol red. This dye is pale yellow below 6.8 ph. and distinctly red above 8.6 ph. He also noted many canary yellow spots in the body, viscera and muscles, as well as areas which were distinctly red. These areas were not limited by anatomical structures. Evidently the hydrogen ion concentration is not constant in the body, and varies widely. There are of course, the changes within the pancreas itself, three master fer-

ments, and one internal secretion. As an illustration of the rapid chemical change which takes place, certain experiments with insulin, to determine its fat regulating effect on the liver, revealed that lecithin would produce a similar reaction, and that the basic substance in lecithin is choline, and that the fat deposit in a liver could be controlled in experimental animals at will, by choline.

The aldehyde of choline is muscarine, which is the active principle of toad-stool poisoning. The most conspicuous symptom of this poison is vomiting, even to the point of apoplexy.

Observing the fat accumulated on the surface of blood drawn for transfusion when the donor has taken food shortly before bleeding, one is convinced that some chemical control of fat metabolism must exist.

Having exhausted surgery and chemistry, we turn first or last, to X-ray. After 20 minutes of lethal raying of a cell, all its activity ceases. Can this ray be made selective: in other words, can it just touch the diseased cell?

In my experience X-rays lack selectivity. No known administered drug will aid to isolate the cell, or to absorb the ray exclusively. In sarcoma one literally chases the tumor all over the body — thigh to mediastinum, lungs to maxillary sinus — and still there are cells which grow regardless of their great radio sensitivity.

SUMMARY

Seven cases have been presented — five of them sarcomas, primary, infiltrative, and secondary. Two of these cases show a metastatic growth diagnosed sarcoma, but at the autopsy, carcinoma was the invasive pancreatic tumor.

Some recent chemical changes are noted, due to disturbance in the pancreatic gland.

The attention is directed to the preponderant metastasis to the lung, especially following deep X-ray therapy.

1930 Wilshire Blvd.

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Modern Management Of Pneumonia

RICHARD M. SMITH, M. D.
Dallas, Texas

PNEUMONIA used to be treated by means of rest; food; measures to relieve pain; fresh air—cool to very cold—on the roof; counter irritants from jackets to plasters; large doses of alcohol (a pint a day) about which one old doctor said, "what a waste"; and circulatory stimulation with digitalis, strychnine, camphor, and pituitrin, digitalis and quinine treatment of Solis Cohen. The mortality rate was between 30 and 35 per cent. As a matter of fact, in the study of a ten-year series with three services at Jefferson Hospital, Philadelphia, from 1918 to 1928, the mortality in the P.D.Q. treatment was 35 per cent; digitalis 34 per cent; and symptomatic 33 per cent.

The next step was to oxygen therapy for which we bought tents at $500.00 each, but finally came down to open-top boxes and the nasal catheter. Then more recently the mask was introduced, and it was and still is of help in some few cases. In the routine cases, however, the mortality rate was not appreciably lowered.

The first great advance in our time was the serum therapy. First, "horse serum" for types one and two; then "rabbit serum"; and 32 types of pneumococcus. The result was a drop in the mortality rate of from 30 to between 12 and 20 per cent, and in a few series even as low as 5 per cent. But the drawbacks to serum therapy were many. It was hard to get outside of medical centers; typing was difficult except in large laboratories with trained workers; the price was high, $50 to $100.00; it was found difficult to administer in the rural districts; and there was fear of reaction. Now, however, these factors have been largely overcome.

And now there is chemotherapy, the great

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benefactor to patient and doctor, of sulfanilamide 2-8 mgms. sulfapyridine 4-15 mgms. sulfathiazole 4-15 mgms. and sulfamethylthiazole with its amazing lowering of mortality to 5 per cent. Each of these drugs, in the order named, has been an improvement over the former in some respects, yet each has carried new hazards to the patient. Yet, it must not be forgotten that at any time one may be sensitized that will supplant this entire group.

The sulfonamides are easy to use; hence they have been given for everything. But, they are harmful drugs, and may poison the patient; then too, their use in diseases of spontaneous cure distorts statistics; they do make patients feel definitely worse; the drug itself can cause fever; and if more and more is given it will produce poisoning.

Let's review the discovery of the sulfonamide drugs. Domagk discovered that sulfa-midochrysoi-dine had a bactericidal action. You will recall that sulfanilamide was first used in 1937. Then in the lancet for May 1938, Whitney described sulfapyridine. Evans and Gansworth in a later issue of the Lancet in 1938, reported 100 cases treated with sulfaypridine in which the mortality was 8 per cent, and another 100 cases treated without the drug and the mortality was 27 per cent. I am sure that you remember that Long and Bliss were the first Americans to use sulfapydrine, and the council on pharmacy of the American Medical Association O.K.'s its experimental use in 1939 after 2000 trials in this country. Sulfathiazol has been used for over a year in this country, and the council accepted it on January 25, 1941. These drugs are looked upon as the greatest advance of all time in the treatment of Pneumonia; but pneumonia covers 50 entities, so think of the amount of good and harm these drugs have done in the few years since their discovery.

In general, what harm have the sulfonamides done to the medical profession. Now we find ourselves less careful in making a diagnosis. All cases with rales in the lungs and fever should not be given chemotherapy. Remember, it does no good in virus diseases such as influenza or "Q" fever. It is no good as a prophylactic in colds against pneumonia; only 1 in a thousand colds goes into pneumonia anyway. Actually, it has, I think, made us neglect patients more than any treatment in recent years. Sulfanilamide was displaced by sulfapyridine in pneumonia in 1938, and now sulfathiazole has displaced it.

And now to compare the toxic effects of sulfapyridine and and sulfathiazol. Nausea and vomiting occur in 60 per cent of cases treated with sulfaypridine; to a lesser degree with sulfathiazole. Kidney crystals, stones, blood and nitrogenous retention are less frequent with sulfathiazole. Destruction of the red and white blood cells is the same with both drugs. Hepatitis seldom occurs with either. Tendency to drug rash and fever is greater with sulfathiazole. Central nervous system upsets occur following the administration of both drugs, but seldom reach the stage of delirium or convulsions. In our experience glucose sulfapyridine has caused less nausea, but it cannot be used by rectum or in the vein; it is inert and will not raise the blood level until broken up in the gastro-intestinal tract.

What about giving sulfapyridine or sulfathiazole by clysis or intravenous injection? In our experience this is unsatisfactory and should be discouraged because of the highly alkalin Ph 10.8; it is more toxic this way; and there is poor blood concentration control that goes up rapidly and falls off. Its use is recommended this way only for immediate action; when it cannot be given by mouth, as in coma; and when it is not absorbed by mouth. For intravenous use Lang and Wood recommended that they be given in 5 per cent solution in distilled water, .06 grm. per kilo of body weight. One minute should be taken for each 5 cc. injection, and 15 cc. will carry the adult dose. This will produce a concentration of 5 mgms. per 100 cc. of blood. These drugs can be given by clysis by putting 35 to 105 grains or 3 to 7 grams in 1000 cc. of warm normal saline. These drugs should never be boiled.

Sulfamethylthiazole is better for experimental use than either sulfapyridine or sulfathiazole, but is more toxic, and has been known to cause peripheral neuritis.

CHEMOTHERAPY VERSUS SERUM THERAPY

This most certainly is a misnomer; both are excellent procedures, and there are times when we cannot afford to be without either

one for success in severe cases. Then too there are numerous advantages to chemotherapy; it *is* cheaper though some users says this is not so when you take into account the laboratory work that is required on blood counts and concentration; it is easier to use; it can be used anywhere; and its use has definitely lowered the mortality rate. As to the combined treatment of serum and sulfonamides, it must be borne in mind that they have an entirely different action.

According to Dr. Plummer the serum has a very complex nature and consists of *precipitins*, which neutralize the toxic carbohydrates; *opsonins* that render the bacteria subject to phagocytosis; agglutinins that cause a clumping of the organisms; and other substances which help the body combat the infection.

So far as is known today the sulfonamide drugs only retard the growth of the organism, and it is up to the patient to do the rest; but on the other hand it has been justly said that the serum fortifies the patient. Our best treatment is probably a combination of chemo and serum therapy, and it is recommended in:

1. All type three cases.
2. Where two or more lobes are involved.
3. In all cases of bacteremia.
4. For all patients over fifty.
5. In pregnancy or the first week postpartum.
6. In those cases not improved after 48 hours of treatment.

Dr. Janet Travell of New York has pointed out that the pneumococcus does become resistant to the drugs, and when it does it is resistant to all the sulfonamide group. She also reports an experiment on mice with type three pneumococcus, in which neither the serum nor sulfapyridine would save the animal, but the combined treatment was successful; this is known as synergistic action.

What about other drugs in the modern care of pneumonic patients? Many of us discontinued the use of digitalis when we learned that at Bellevue Hospital in 1930, in a series of 800 cases of pneumonia, every other patient was given digitalis routinely, and the mortality rate was 41.4 per cent with, 33.7 per cent without. Always bear in mind however that it should be given where there is fibrillation and decompensation. Do not use purgatives; they have a tendency to cause nausea and gastrointestinal upset. An enema is much better. Watch the patient's chlorides; some workers think that a marked drop is the cause of peripheral circulatory collapse. Strychnine is of no value, even up to 1/10 grain dosage. Barbituric acid compounds should be used only in small doses, if at all. They depress respiration, and in some cases cause mental confusion. In our experience morphine and codeine have been found best for sedation, control of cough, and relief of pain.

In the treatment of pneumonia X-ray therapy cannot be disregarded, and a few good men continue to use it. Emmett Settle in Illinois has a series of 34 cases treated exclusively with X-ray. His mortality rate was 6.5 per cent. He first treats the lateral field, then the anterior and posterior.

Fred Decker, also of Illinois, has done a lot of work along this line with good results. He combined X-ray therapy with serum, and with the sulfonamide drugs. His poorest results were with the X-ray and sulfonamide drugs; in his opinion this combination is unsatisfactory. We have had very little experience in our practise with these methods, and with the present status of chemo and serum therapy we would be afraid to leave off either one for X-ray therapy alone. Experimentally it is an interesting study.

As soon as we are relatively sure a patient has pneumonia our usual procedure is to give 2 to 4 grams of sulfathiazole by mouth; collect sputum for typing, but if there is no sputum the throat should be swabbed for culture; then collect blood for culture; get a complete blood count; continue the drug in 1 gram doses every 4 hours day and night. The patient is given a general diet. Morphine gr. 1/6 to ¼ by hypodermic P. R. N. for cough, and for pain and restlessness codeine and pantopon also are given. If the laboratory does not find a pneumococcus, the drug is stopped; but if type 1, 2, 3, 5, 7, 8, or 14 is found rabbit serum is considered in view of the previously stated criteria, and used along with sulfathiazole if deemed wise.

During chemotherapy daily urine examinations are made for crystals and fed blood cells. Daily blood counts are done to be informed of any marked fall in the red or white blood cells. A daily sulfathiazole blood concentration is also

run; and if found to be below 2 mgs. per 100 cc. of blood the dose is increased 1 gram every 4 hours; if above 10 mg. the dose is reduced. The same dose is continued for 24 hours after the fever comes down, and half the dose for an additional 24 hours. The average total dose ranges from 25 to 50 grams.

In regard to the total dose of sulfathiazole, we recently had a patient who took over 200 grams of the drug in a little over two weeks during a staphylococcic septicemia. The appearance of red blood cells and crystals in the urine, and a marked skin rash did not make us stop the drug; it was combined with Julianelle's staphylococcus serum, and this patient recovered.

When we use rabbit serum our initial dose is 100,000 units, and this is repeated in 12 to 24 hours if needed.

One interesting fact is that we see very few of the old complications of pneumonia such as, empyema, uncontrollable distention, and circulatory collapse.

4105 Live Oak St.

Flocculation Tests for Syphilis

(Plant Sap Reactions)

EDWARD L. BREAZEALE, M. S.,
THEODORE R. REUSSER, B. S.,
and
JAMES F. BREAZEALE, B. S.
Tucson, Arizona

I. TOPS

PROBABLY the greatest advancement in the serology of syphilis in the past year has been the recognition of the existence of biologically false positive tests in the non-syphilitic groups of individuals. Kahn has brought out his verification test; Eagle his spirochaetal absorption, and various other investigators have devised modifications of standard tests designed to distinguish between true positive reactions and biologically false positive reactions. The exact cause of these false positive tests in diseases other than syphilis has not been completely explained, nor has the presence of positive reactions in most animal sera been satisfactorily explained.

Today we recognize that a number of diseases will produce positive reactions in the flocculation tests for syphilis. All of these diseases are of the febrile or degenerative type, such as malaria, typhoid fever, tuberculosis, malta fever, pneumonia, leprosy, infectious mononeuclosis, and many more.

Porro [1] in 1933 was one of the first investigators to point out the fact that animal sera, when inactivated in the same manner as human sera, gave a surprisingly high incidence of positive Kahn reactions. Greene and his associates [2] in 1928 studied a large group of animals and found that there was a wide variation in the results obtained using the various flocculation tests and also a wide variation between the various species studied. Since the publication of these papers a great amount of work has been done on animal sera all confirming the earlier work. The exact mechanism of these biologically false positive tests is not clearly understood. Some investigators are of the opinion that they are the same as those causing positive tests in syphilitic sera while others do not think so. Kahn [3] is of the opinion that all animals have a low grade spirochaetal infection not necessarily T. *palida* but some related organism which gives rise to antibodies serologically resembling those produced in syphilis. Various quantitative studies on human and animal sera have been made in this laboratory, [4, 5, 6]. In human and cow sera the maximum titre obtained was 1 to 64; in horse sera, 1 to 128.

The present studies were undertaken in an effort to show that (a) the test as employed in the diagnosis of syphilis is purely an empirical procedure and that other substances than the so-called reagin of syphilis can produce positive flocculation tests; (b) that these sub-

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(Continued on page 256)

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BASIC SCIENCE BOARD IN NEW MEXICO

Physicians in the Southwest have long watched with much interest the struggle of the profession in New Mexico to provide legal methods of protecting the people against unlicensed, unbridled quackery. For several years attempts have been made to get the State Legislature to pass truly unbiased laws regulating the practice of medicine.

Elsewhere in this issue is the text of New Mexico's newly-passed "Basic Science" law. It resembles the type of law in force in most other states fortunate enough to possess such legislation—just up to a certain point! That point of deviation is (sure enough, read it yourself) that the Board is made up of a physician, an osteopath and a chiropractor!! In other words, this is no Basic Science Board at all. Most other states use only unbiased scientists on their boards, with no member of medicine or any of the quack cults represented thereon. In such cases an objective, honest appraisal of candidate's basic training and knowledge is possible.

Imagine a chiropractor or an osteopath being competent to examine anything aside from the multiplication and interest tables! Truly, sometimes our State Legislatures do wondrous strange things!

WHAT TO DO

In the civilian population there is in general quite as much willingness to adopt measures of preparedness in the defence of this nation as exists in the military services. The question so often is "What To Do?" That is well answered by the Lehigh County (Pa.) Medical Bulletin — at least for the civilian medical profession. The schedule is frankly modelled after procedures found feasible by the British. When these ideas were first promulgated it will be recalled that the war was called "phony" by various of our heavy thinkers, and many in England were inclined to scoff rather cynically at civilian defence measures. Tragically enough, the scoffers at the "Home Guards" saw the day come when civilian defence alone saved the country from downfall. May that day never come to America. Yet to the foresighted, the hints below may be valuable:

What the County Society Can Do:

1. Bolster and aid in maintaining public morale.
2. Sponsor
   a. Blood typing campaigns
   b. Tetanus immunization campaigns, and
   c. Later—typhoid inoculations
   d. Rodent control, information controls
3. Establish (provisionally) the organization for
   a. Base hospitals
   b. Clearing stations
   c. Aid centers.
4. Educate large groups in (if and when need seems imminent)
   a. Gas and gas mask usage, symptoms, treatment
   b. Control of hemorrhage
   c. First aid for
      (1) Fractures
      (2) Wounds
      (3) Burns
   d. Sanitation and water safety meas-

ures. Publish bulletins, circulars, and placards for above.

5. Set up the proper personnel for all above casualty stations.

6. Be prepared to train civilian resuscitation squads.

7. Be prepared to train decontamination squads.

8. Be prepared to train transfusion teams.

9. Be prepare dto train fracture teams.

10. Be prepared to establish sera and chemotherapy stations.

11. List all trucks for ambulance usage.

12. List all private cars for messengers and supply usage.

13. Establish a sanitary committee to work with the city engineer's office in re-establishing sewer control and disposal of the dead (animals and humans).

14. Set up an executive control to co-ordinate all above with the civic authorities and with all trained groups, such as the Red Cross, civilian nurses, American Legion, Boy Scouts, etc., and aid the above program through their leaders.

15. Co-ordinate with state and national medical societies.

16. Co-ordinate with military requirements.

What the Individual Physician Can Do:

1. Keep up to date with foreign letters in the A. M. A. Journal, A. R. P. bulletins, war medicine, etc.

2. Review modern treatment of war wounds, gassed cases, neuroses, etc.

3. Type or have typed all people possible.

4. Give tetanus toxoid when possible.

5. Dissipate defeatism.

6. Respond promptly to requests from A. M. A. and State Society.

WAR'S VENEREAL PROBLEMS

It is recognized that various interlocking problems of public health spring up in communities adjacent to a concentration of troops. One of the perplexing problems is that presented by venereal diseases. Yet, with cooperation between military and civilian health authorities, the problem is not incapable of solution. Representatives of the Surgeon Generals of the Army, navy and public health service have recently formulated an agreement to stimulate the control of venereal diseases. El Paso, Phoenix, Tucson and Albuquerque should be especially interested, these cities all being sites of troop concentration. The agreement:

It is recognized that the following services should be developed by state and local health and police authorities in cooperation with the Medical Corps of the United States Army, the Bureau of Medicine and Surgery of the United States Navy, the United States Public Health Service and interested voluntary organizations:

(1) Early diagnosis and adequate treatment by the Army and the Navy of enlisted personnel infected with the venereal diseases.

(2) Early diagnosis and treatment of the civilian population by the local health department.

(3) When authentic information can be obtained as to the probable source of extramarital venereal disease infection of military or naval personnel, the facts will be reported by medical officers of the Army or Navy to the state or local health authorities as may be required. If additional authoritative information is available as to extramarital contacts with diseased military or naval personnel during the communicable stage, this should also be reported.

(4) All contacts of enlisted men with infected civilians to be reported to the medical officers in charge of the Army and Navy by the local or state health authorities.

(5) Recalcitrant infected persons with communicable syphilis or gonorrhea to be forcibly isolated during the period of communicability; in civilian populations it is the duty of the local health authorities to obtain the assistance of the local police authorities in enforcing such isolation.

(6) Decrease as far as possible the opportunities for contacts with infected persons. The local police department is responsible for the repression of commercialized and clandestine prostitution. The local health departments, the State Health Department, the Public Health Service, the Army, and Navy will cooperate with the local police authorities in repressing prostitution.

(7) An aggressive program of education both among enlisted personnel and the civilian population regarding the dangers of the venereal diseases, the methods for preventing these infections, and the steps that should be

taken if a person suspects that he is infected.

(8) The local police and health authorities, the State Department of Health, the Public Health Service, the Army, and the Navy desire the assistance of representatives of the American Social Hygiene Association or affiliated social hygiene societies or other voluntary welfare organizations or groups in developing and stimulating public support for the above measures.

FLOCCULATION TESTS FOR SYPHILIS

(Continued from page 253)

stances responsible for the production of positive flocculation tests are found widely distributed in nature and (c) that these reagin-like substances are found in high concentration in plant saps.

EXPERIMENTAL

Stems and leaves of the various plants were collected and frozen in the ice box until ready to be extracted. The samples were then thawed and their saps extracted by use of a Carver hydraulic plant press, using a pressure of 10,000 pounds per square inch. In most cases the sap so obtained was clear and free from solid suspended particles. In the cases where a turbid sap was obtained, the sample was centrifuged at a speed of 4000 rpm for ten minutes, and the clear supernatant fluid drawn off. Kline diagnostic, Mazzini, Leiboff, and the rapid Hinton and Wasserman tests were run on three separate samples of each species examined. None of the saps were inactivated, as it was found that heating at 56-C. for even ten minutes would coagulate some of the material in the sample. The various saps were then diluted, using normal saline until they no longer gave a positive test.

RESULTS

The results obtained are shown in Table I. The highest dilution where a positive test was obtained, but where any further dilution gave negative results, is expressed as the highest titre.

TABLE I.

Plant	Kline	Mazzini	Leiboff	Hinton	Wasserman	Max. Titre
1. Wild Spinach	4+	4+	4+	pos.	A.C.	1-128
2. Yucca	pos.	pos.	pos.	pos.	neg. as soon as added	1-128
3. Dock	pos.	pos.	pos.	pos.	neg.	1-128
4. Burrow Weed	pos.	pos.	pos.	pos.	A.C.	1-64
5. Phacelia	pos.	pos.	pos.	pos.	A.C.	1-64
6. Johnson Grass	pos.	pos.	pos.	pos.	neg.	1-64
7. Wild Sunflower	neg.	neg.	neg.	neg.	A.C.	0
8. Sweet Elyssium	pos.	pos.	pos.	pos.	neg.	1-64
9. Sour Clover	pos.	pos.	pos.	pos.	neg.	1-32
10. Elderberry	pos.	pos.	pos.	pos.	neg.	1-32
11. Gray Sage	pos.	pos.	pos.	pos.	neg.	1-64
12. Wild Mustard	pos.	pos.	pos.	pos.	neg.	1-128
13. Jasmine	pos.	pos.	pos.	pos.	neg.	1-128
14. Oleander	pos.	pos.	pos.	pos.	neg.	1-164
15. Eucalyptus	pos.	pos.	pos.	pos.	A.C.	1-128
16. Rye Grass	pos.	pos.	pos.	pos.	A.C.	1-128
17. Orange	pos.	pos.	pos.	pos.	A.C.	1-64
18. Mulberry	pos.	pos.	pos.	pos.	neg.	1-128
19. Cottonwood	pos.	pos.	pos.	pos.	neg.	1-128
20. Wild Tobacco	pos.	pos.	pos.	pos.	neg.	1-64
21. Pepper Tree	pos.	nos.	pos.	pos.	neg.	1-128
22. Fig	pos.	pos.	pos.	pos.	A.C.	1-256
23. Amaryllis	pos.	pos.	pos.	pos.	neg.	1-256
24. Calendula	pos.	pos.	pos.	pos.	neg.	1-128
25. Snapdragon	pos.	pos.	pos.	pos.	A.C.	1-128
26. Hollyhock	pos.	pos.	pos.	pos.	neg.	1-128
27. Larkspur	pos.	pos.	pos.	pos.	neg.	1-64
28. Artichoke	neg.	neg.	neg.	neg.	A.C.	0
29. Mallow Weed	pos.	pos.	pos.	pos.	neg.	1-128
30. Stock	pos.	pos.	pos.	pos.	neg.	1-256
31. Cabbage	pos.	pos.	pos.	pos.	neg.	1-256
32. White Clover	pos.	pos.	pos.	pos.	neg.	1-128
33. White Clover	pos.	pos.	pos.	pos.	neg.	1-128
33. Iris	pos.	pos.	pos.	pos.		1-256
34. California Poppy	pos.	pos.	pos.	pos.		1-128
35. Grape	pos.	pos.	pos.	pos.		1-128
36. Tamarisk	pos.	pos.	pos.	pos.		1-64
37. Rose	pos.	pos.	pos.	pos.		1-128
38. Sweet Pea	pos.	pos.	pos.	pos.		1-128
39. Milk Weed	neg.	neg.	neg.	neg.		0
40. Umbrella Tree	pos.	pos.	pos.	pos.		1-128
41. Corn	pos.	pos.	pos.	pos.		1-32
42. Wheat	pos.	pos.	pos.	pos.		1-32
43. Rep Poppy	pos.	pos.	pos.	pos.		1-128
44. Radish	pos.	pos.	pos.	pos.		1-128
45. Lyppia	pos.	pos.	pos.	pos.		1-128
46. Verbena	pos.	pos.	pos.	pos.		1-128
47. Ice Plant	pos.	pos.	pos.	pos.		1-128
48. Onion	pos.	pos.	pos.	pos.		1-64
49. Cotyledon	pos.	pos.	pos.	pos.		1-128
50. Poinsettia	pos.	pos.	pos.	pos.		1-64

Table II. gives the results of diluting the various plant saps showing the reaction at the various dilutions using the Kline Diagnostic test.

TABLE II.

The Titratoin of Plant Saps Showing Curve On Diluiton

PLANT	Undiluted	1:1	1:2	1:4	1:8	1:16	1:32	1:64	1:128	1 256
2. Yucca	4+	4+	4+	4+	3+	3+	3+	2+	+	neg.
3. Dock	2+	2+	2+	2+	2+	2+	1+	1+	+	neg.
4. Burrow Weed	4+	4+	4+	4+	4+	4+	3+	3+	1+	neg.
5. Sour Clover	4+	4+	4+	3+	3+	3+	2+	1+	neg.	-
6. Amaryllis	2+	2+	2+	2+	2+	1+	1+	neg.	-	-
1. Wild Spinach	4+	4+	4+	4+	4+	4+	4+	3+	2+	1+

The average pH of the plant saps studied varied from slightly acid (pH 6.8) to slightly basic (pH 7.2).

DISCUSSION

The exact explanation of the observed phenomenon is not readily forthcoming at this time. However, there must be some substance in the plant saps that is responsible for changing the lyophilic colloid in the antigen emulsion to a lyophilic colloid as used in the flocculation tests. Wassermann reactions (U. S. Vet erans' Administration modification) were not run on all of the species examined. In the series of 32 run, none gave positive complement fixation tests. A surprisingly large number gave negative reactions which was in all probability due to the presence of saponines which would hemolyze the erythrocytes used in the test.

An examination of table I. will reveal that this phenomenon of the presence of a reagin-like

substance in plant saps is not limited to one family, but is distributed over a large number of families. Also of interest is the high titres obtained on dilution of the samples, as was brought out earlier in the paper, the maximum titres obtained in this laboratory on positive human and animal sera were 1:64 and 1:128, while those obtained on the various plant saps studied were as high as 1:256.

The question of the pH of the saps does not explain the production of positive flocculation tests by the plant juices. The saps gave pH readings from 6.8 to 7.2 which is well within the limits of pH range for the tests. Eagle (7) has stated that "it has not yet been possible to introduce a true positive Wassermann in originally negative human sera by simple physical or chemical manipulation. Highly significant is the fact that these treated sera are consistantly flocculation negative." A small series (10) were adjusted to a pH of 7.2 by the addition of N/20 NaOH without change in their flocculation reactivity of the plant saps.

The figures shown in table II. are interesting since they show that there is a sharp break in the degree of positively on dilution. That is, the saps may be diluted with saline and the reactivity will not change until one or two dilutions before they give negative results. This is just the reverse as is found in human and animal sera, where we find a gradual decrease in degree of reactivity from the low dilutions up to the final or negative dilutions.

Experiments are now in progress that, it is hoped, will explain the observed phenomenon. Experiments on plant finding, the reaction of the sap from the various parts of the plant, the age of the plant and the effect of supersonic waves on plant saps as regards the flocculation tests are now in progress.

CONCLUSIONS

1. Of the fifty plant saps studied, forty-six gave positive serological results with the Kline, Mazzini, Lieboff, and Hinton tests.

2. None of the plant saps studied gave positive Wassermann reactions.

3. The reagin like substance in the plant saps was present in varying amounts as shown by the titres obtained.

University of Arizona.

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Special Section

New Mexico Medical Society

L. B. COHENOUR, M.D., Albuquerque
Associate Editor

Fifteenth Legislature State of New Mexico

HOUSE WAYS AND MEANS
COMMITTEE SUBSTITUTE TO
HOUSE BILL No. 123

AN ACT

TO ESTABLISH A STATE BOARD OF EXAMINERS IN THE BASIC SCIENCES UNDERLYING THE PRACTICE OF THE HEALING ARTS, TO PROVIDE FOR ITS ORGANIZATION AND POWERS, TO PROVIDE THAT CERTIFICATION BY SUCH BOARD BE A PREREQUISITE TO ELIGIBILITY FOR EXAMINATION FOR LICENSE TO PRACTICE THE HEALING ARTS AND TO DEFINE HEALING ARTS.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF NEW MEXICO:

Section 1. BASIC SCIENCE CERTIFICATE REQUIRED. No person shall be eligible for examination or permitted to take an examination for a license to practice the healing art or any branch thereof, or granted any such license, unless he has presented to the licensing board or officer empowered to issue such a license, a certificate of ability in anatomy, physiology, chemistry, bacteriology and pathology, (hereinafter referred to as the basic sciences), issued by the State board of examiners in the basic sciences.

Section 2. THE HEALING ART DEFINED. For the purposes of this act, the healing art includes any system, treatment, operation, diagnosis, prescription, or practice for the ascertainment, cure, relief, palliation, adjustment, or correction of any human disease, ailment, deformmity, injury, or unhealthy or abnormal physical or mental condition.

Section 2a. LICENSE TO PRACTICE. For the purpose of this Act, any license authorizing the licentiate to offer or undertake to diagnose, treat, operate on or prescribe for any human pain, injury, disease, deformity or physical or mental condition is a license to practice the healing art.

Section 3. BOARD OF EXAMINERS IN THE BASIC SCIENCES; APPOINTMENT AND PERSONNEL. The Governor shall appoint a State Board of Examiners in the Basic Sciences (hereinafter referred to as the Board), consisting of five (5) members, who shall be appointed, one for one (1) year, one for two (2) years, one for three (3) years, one for four (4) years, and one for five (5) years, from the date of their respective appointments. On the expiration of the term of any member, the Governor shall fill the vacancy by appointment for a term of five (5) years. On the death, resignation, or removal of any member, the Governor shall fill the vacancy by appointment for the unexpired portion of the term. Every member shall serve until his successor is appointed and qualified. The Board shall consist of one doctor of medicine, one doctor of osteopathy, one doctor of chiropractic, and two laymen learned in the basic sciences. Each member shall have resided in New Mexico not less than one year next preceding his appointment and shall have been, during such period, actively engaged in the practice of healing arts of the profession in which he professes membership, except the two laymen. The members of the Board shall be selected because of their knowledge of the basic sciences aforesaid.

Section 4. ORGANIZATION OF BOARD: ELECTION OF OFFICERS, SEAL, COMPENSATION. The Board shall meet and organize as soon as practicable after appointment. It shall have power to elect officers, to adopt a seal and to make such rules as it deems expedient to carry this Act into effect. The Board shall employ to perform all secretarial and clerical duties of the Board a lay secretary, who shall at the time of said appointment be a regular employee on the staff of the Secretary of State. In addition to his or her regular emoluments, the lay secretary shall receive One Hundred Dollars ($100.00) per annum to be paid from the special fund to the credit of the Board for the performance of the duties herein required. The Board shall keep a record of its proceedings, which shall be prima facie evidence of all matters contained therein. Each member of the Board shall receive ten dollars ($10.00) per annum and actual expenses, when actively engaged in the discharge of his duties. The compensation of the members and other expenses of the Board shall be paid out of the fees received from applicants. The lay secretary shall give such bond, running in favor of the State, as the State Treasurer shall determine. The office of the Board shall be in the State Capitol and quarters for such office shall be assigned in the Capitol Building or any other building occupied by the State government.

Section 5. FEES PAYABLE BY APPLICANTS. The fee for examination by the Board shall be twenty-five dollars ($25.00). The fee for reexamination within any twelve month period as hereinafter provided shall be fifteen dollars ($15.00), but the fee for reexamination after the expiration of twelve months shall be the same as the original fee. The fee for the issue of a certificate by authority of reciprocity, on the basis of qualifications as determined by the proper agency of some other State, shall be twenty-five dollars ($25.00). All fees shall be paid to the Board by the applicant at the time of filing application. The Board shall pay all money received as fees into the State Treasury, to be placed in a special fund to the credit of the Board. The State Treasurer shall pay out of such fund all expenses incurred by the Board, on vouchers signed by the president and the secretary of the Board.

Section 5A. DUTIES OF LAY SECRETARY. The duties of the lay secretary shall be as follows: (1) to receive and file all applications; (2) to receive and pay over to the State Treasurer all application fees; (3) on the day appointed for the examination, to provide in

separate sealed envelopes sufficient duplicate numbers to be drawn by the assembled candidates from a container. One of said duplicate numbers shall be retained by the candidate and placed on all his examination papers; the other number bearing his name shall be deposited in an envelope, sealed, and returned by the candidate to the lay secretary. Said sealed envelope shall be retained unopened by the lay secretary until all examination papers have been graded and the result of the examination publicly posted in the office of the Secretary of State; provided that should any candidate place or cause to be placed, any mark of identification, other than the number drawn by him, on any of his said examination papers, the Board shall reject said examination papers for grading, which action shall automatically disqualify the candidate, as having passed the examination; (4) to distribute a list of examination questions to each candidate; (5) act as monitor during the period the examination is being written; (6) collect the completed examination papers and transmit the same to the Board for grading; (7) keep the identity of the candidates anonymous to the Board until all examination papers have been graded; (8) publicly post the results of the examination by the candidates number; (9) maintain all files and perform all clerical functions for the Board.

Section 6. EXAMINATIONS. The Board shall conduct examinations at such times and places as it deems best. Every applicant, except as hereinafter provided, shall be examined to determine his knowledge, ability and skill in the basic sciences. The examination shall be conducted in writing; all examination questions shall be printed or mimeographed. If the applicant receives a credit of 75 per cent or more in each of the basic sciences, he shall be considered as having passed the examination. If the applicant receives less than 75 per cent in one subject and received 75 per cent or more in each of the remaining subjects, he shall be allowed a re-examination at the examination next ensuing, on application and payment of the prescribed fee; but he shall be required to be re-examined in all subjects. If the applicant shall receive less than 75 per cent in more than one subject, he shall not be re-examined within the period of one year next following his examination, nor unless he presents proof satisfactory to the Board of additional study in the basic sciences sufficient to justify re-examination. No member of the Board, nor the Board acting as a whole, shall have or shall exercise the right or privilege of interviewing any candidate or reviewing his record prior to the time his examination papers have been graded by the Board and publicly posted as hereinabove provided.

Section 7. REQUIREMENTS FOR CERTIFICATE. No certificate shall be issued by the State Board of Examiners in the basis sciences unless the person applying for a certificate submits evidence satisfactory to the board: (1) that he is not less than twenty-one years of age; (2) that he is a person of good moral character; (3) that he was graduated by an accredited high school or school of similar grade, or possessed educational qualifications equivalent to those required for graduation by such an accredited high school, before he began the study of the healing arts, and (4) that he has a comprehensive knowledge of the basic sciences as shown by passing the examination given by the Board, as by this Act required. The healing arts or branch thereof intended to be practised by the applicant shall not be disclosed in his application.

Section 8. RECIPROCITY: The State Board of Examiners in the Basic Sciences may in its discretion waive the examination required by Section 7, when proof satisfactory to the Board is submitted showing that the applicant has passed the examination in the basic sciences before a board of examiners in the basic sciences or a board authorized to issue licenses to practice the healing art, in another State or the District of Columbia when the requirements of that State are, in the opinion of the Board, not less than those provided by this Act. The provisions of this Section shall apply only to examinations conducted by the boards or officers of States that grant like exemption from examination in the basic sciences to persons granted certificates by the Board of this State. Licentiates to practice the healing art as defined herein, from other States, who were licensed to practice such healing arts prior to the year 1907, providing that such licentiates have been in continuous practice since that time, may also be certified

without examination under the provisions of this section.

Section 9. APPEAL FROM BOARD'S DECISION. Any applicant who has been denied examination by the Board may within thirty days after such denial appeal to the District Court for the County in which the Board has its office; and such court shall on such appeal inquire into the cause of such denial. If in the opinion of the court admission to examination was refused without just cause, the court may order the Board to examine the applicant. Notice of an appeal from the denial of the Board of the right to examination may be served on any member of the Board by leaving with him or with any adult member of his staff or household, at his usual place of business or abode, an attested copy thereof within thirty days after said Board has notified the applicant of its refusal to examine him. Hearings of such appeals shall proceed in accordance with such rules as the District Court may determine.

Section 10. CERTIFICATE AND LICENSES VOID. Any basic science certificate and any license to practice the healing art or any branch thereof which is issued contrary to this Act shall be void. A board which has issued a license by virtue of a void basic science certificate shall revoke or cancel such license. The procedure for such revocation or cancellation shall be in accordance with the provisions of the Act under which such license was issued, for the cancellation or revocation of licenses generally. The certificate issued to any person by the State Board of Examiners in the basic sciences shall be automatically revoked by the revocation of any license issued to such person to practice the healing art or any branch thereof.

Section 11. PRACTICE WITHOUT BASIC SCIENCE CERTIFICATE FORBIDDEN. Any person who shall practice the healing art or any branch thereof without having obtained a valid certificate from the State Board of Examiners in the basic sciences, except as otherwise authorized by this Act, shall be guilty of a misdemeanor and shall be fined not less than Fifty Dollars ($50.00), or more than Two Hundred Dollars ($200.00), or imprisoned for not less than ten (10) days or more than sixty (60) days, or both, in discretion of the court trying such case.

Section 12. FRAUDULENT CERTIFICATE FORBIDDEN. Any person who shall obtain or attempt to obtain a basic science certificate by any dishonest or fraudulent means, or who shall forge, counterfeit or fraudulent alter any such certificate shall be guilty of a misdemeanor and shall be fined not less than Fifty Dollars ($50.00) or more than Two Hundred Dollars ($200.00), or imprisoned not less than ten (10) days or more than sixty (60) days, or both, in the discretion of the court trying the case.

Section 13. FRAUDULENT LICENSES FORBIDDEN. Any person who shall obtain or attempt to obtain a license to practice the healing art or any branch thereof from any board authorized to issue any such license, without presenting to said licensing board a valid certificate issued by the State Board of Examiners in the basic sciences as in this Act required shall be guilty of a misdemeanor and shall be fined not less than Fifty Dollars ($50.00) or more than Two Hundred Dollars ($200.00) or imprisoned not less than ten (10) days or more than sixty (60) days, or both, in the discretion of the court trying the case.

Section 14. ISSUE OF FRAUDULENT LICENSES FORBIDDEN. Any person who knowingly issues or participates in the issue of a license to practice the healing art, or any branch thereof, to any person who has not presented to the licensing board a valid certificate from the State Board of Examiners in the basic sciences, or any person who has presented to such a licensing board any such certificate obtained by dishonesty or fraud, or any forged or counterfeit certificate shall be guilty of a misdemeanor and shall be fined not less than Fifty Dollars ($50.00) or more than Two Hundred Dollars ($200.00) or imprisoned not less than ten (10) days or more than sixty (60) days, or both, in the discretion of the court trying the case.

Section 15. FEES PAID UNAUTHORIZED PRACTITIONERS RECOVERABLE. Any money paid out by any person as compensation for services rendered in the practice of the healing art or any branch thereof to any person not validly licensed to practice such

healing art or branch, when the payor did not know that such person was not validly licensed so to practice, may be recovered by the person who has paid such money by a suit instituted within two years from the date when such fee or compensation was paid.

Section 16. ENFORCEMENT. The State Board of Examiners in the Basic Sciences and the various boards authorized to issue licenses to practice the healing art or any branch thereof shall investigate any supposed violation of this Act and report to the proper district attorney all the cases that in the judgment of such board warrant prosecution. Every police officer, sheriff, and peace officer shall investigate all supposed violations of this Act and apprehend and arrest all violators thereof. It shall be the duty of the several district attorneys to prosecute violations of this Act.

Section 17. EXCEPTIONS. This Act shall not be construed as applying to dentists, nurses, midwives, chiropodists or optometrists, practicing within the limits of their respective callings nor to that religion sect known as Christian Scientists; nor to other person licensed to practice the healing art or any branch thereof in this State when this Act takes effect; nor to persons specifically permitted by law to practice without license, practicing within the limits of the privileges thus granted to them.

Section 18. SAVING CLAUSE. No provision of this Act shall be construed as repealing any statutory provision in force at the time of its passage with reference to the requirements governing the issuing of licenses to practice the healing art or any branch thereof; but any board authorized to issue licenses to practice the healing art or any branch thereof may in its discretion accept certificates issued by the Board of Examiners in the basic sciences in lieu of examining applicants in such sciences or may continue to examine applicants in such sciences as heretofore. The uncontitutionality of any part of this Act shall not be construed as invalidating any other part thereof.

Section 19. SHORT TITLE. This act may be cited as "Basic Science Act, 1941."

FRANK J. McCARTHY
Speaker of the House
A. L. NILSON
Chief Clerk

CEFERINO R. QUINTANA
President of the Senate
EVA ELLEN SABIN
Chief Clerk

Signed by me this 18th day of April, 1941,
JOHN E. MILES
Governor of New Mexico

COMMUNICATIONS

Sir:

In his article "Test for Serum Sensitivity," in the May issue of your journal, Dr. LeMar reports another instance of death due possibly to the improper use of the cutaneous test in the search for a dangerous type of allergic sensitivity.

The physician who administered the intracutaneous test in that case injected 5 to 10 times the quantity of the 1:100 solution of serum that has been found proper for the purpose; larger amounts sometimes cause non-specific reactions that are not distinguishable from specific ones.

It is true that the rapidity of the fatal reaction suggests that the injection was intravascular: nevertheless, it may well be that the fatal termination might not have occurred had the correct quantity (0.01 to 0.02 cc.) been injected.

When, as in the reported case, a sensitivity to horse dander is known to exist, the absolutely reliable and safe method of passive transfer, recommended by J. Alexander Clarke of Philadelphia, is easily available.

Yours very truly
ARTHUR F. COCA, M. D.

This letter was referred to Dr. LeMar, who replies below:

Sir:

I am happy to have the opportunity to comment on the case of death following intracutaneous testing with horse serum reported in my paper in your journal in May 1941.

The details concerning this case might be of considerable interest. It was a young woman who had been injured in a minor automobile accident. Her injury was relatively slight con-

sisting of a small puncture wound on the leg. Since the wound was badly contaminated, the physician who saw her thought that antitetanic serum was indicated. She was given .01 cc. of tetanus antitoxin diluted 1:100 in the skin of the forearm. The person who administered the serum later stated that perhaps within a minute after its administration she complained of vertigo and of intense itching about the injection site. Very soon thereafter she suddenly complained of difficulty in breathing and collapsed and fell from the chair on which she was sitting. Deep cyanosis, cessation of respiration and rapid, thready pulse were found by those who saw her then. I saw her approximately three minutes after the dose had been given and at that time no pulse was perceptible and there were no respiratory movements. Adrenalin was administered by the intracardiac route and other supportive measures applied, including artificial respiration, but she never showed any sign of life. The family refused postmortem examination.

Close questioning of the person who administered the serum showed that he made no attempt to take a history in regard to known sensitivity to other substances. Relatives stated that she developed asthma on coming close to horses and that she had had asthma and attacks of urticaria since early childhood. Since an autopsy was not permitted, it was impossible to investigate the case further.

As Dr. Coca has stated, this was a very large dose to be given, particularly in the presence of a past allergic history. It is hard to understand how sufficient absorption could occur in that length of time to cause a fatal shock and I have always felt that very likely part of the dose, at least, was really given subcutaneously and into a small vessel.

The possibility of pulmonary embolism or of a cerebral accident were considered and could not, of course, be entirely ruled out. The same is true of splenic or liver damage with hemorrhage. However, the findings did not make any of these seem likely and a complete physical examination previous to the administration of serum did not indicate any injury except the minor puncture wound. This, together with the history of sensitivity to horse dander, would make it seem most likely that this was a case of true atopic shock.

I would appreciate hearing from you or from any other person having seen similar cases. Thanking you again, I am

Yours very truly,

JOHN D. LEMAR, M. D.

JOHN D. LEMAR, M. D.
Asst. Prof. of Public Health
University of Nebraska College of Medicine
Omaha, Nebraska

NEWS

General

Examinations for appointments in the Medical Corps of the United States Navy have recently been announced by Rear Admiral Ross T. McIntire, the Surgeon General of the Navy.

Examinations will be held at all of the larger naval hospitals and at the Naval Medical Center, Washington, D. C. Applications for authorization to take the examination must be in the Bureau of Medicine and Surgery three weeks prior to the date of the examination. Application forms for these examinations will be forwarded by the Bureau of Medicine and Surgery, Navy Department, Washington, D. C., upon request. Examinations will be held according to the following schedules:

Acting Assistant Surgeon for intern training: October 6 to 9, 1941, inclusive; January 5 to 9, 1942, inclusive.

Assistant Surgeon: October 6 to 9, 1941, inclusive; January 5 to 9, 1942, inclusive.

Applicants for appointment as Acting Assistant Surgeon for intern training are required to be citizens of the United States of over 21 but less than 32 years of age, members of the junior or senior class in class "A" medical schools, be able to meet the physical and other requirements for appointment.

Applicants for appointment as Assistant Surgeon are required to be citizens of the United States of over 21 but less than 32 years of age, graduates of class "A" medical schools, to have had at least one year of intern training in a hospital accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Associa-

tion, and to meet the physical and other requirements for appointment.

Acting Assistant Surgeons for intern training are assigned to United States Naval Hospitals which have been accredited for intern training by the Council on Medical Education and Hospitals of the American Medical Association, and after they have completed twelve months of intern training may, if they desire, apply for appointment as Assistant Surgeon in the regular Navy.

The thirty-first annual Clinical Congress of the American College of Surgeons will be held in Boston, November 3 to 7, with headquarters at the Statler and Copley-Plaza hotels. The twenty-fourth annual Hospital Standardization Conference sponsored by the College will be held concurrently. About five thousand surgeons and hospital executives from all parts of the western hemisphere are expected to gather in Boston for these meetings, the program for which will include clinics and demonstrations in local hospitals and medical schools, as well as scientific sessions, conferences, medical motion picture showings and exhibits in the headquarters hotels.

The Chairman of the Board of Regents of the American College of Surgeons is Dr. Irvin Abell of Louisville and the President is Dr. Evarts A. Graham of St. Louis. The President-Elect is Dr. W. Edward Gallie of Toronto, who will be inaugurated at the presidential meeting and convocation to be held the evening of November 3 in Symphony Hall, when several hundred initiates will be received into the fellowship of the College. In charge of local arrangements for the Clinical Congress is a committee of Boston surgeons headed by Dr. Leland S. McKittrick, Chairman, and Dr. Richard H. Sweet, Secretary.

El Paso

At the regular meeting of the City-County Hospital Staff, Wednesday, July 16, 1941, at City-County Hospital, the following program was given:

"Congenital Bilateral Hydronephrosis.....
.....Dr. Robert Thompson
Discussion by Dr. Wickcliffe Curtis.

The regular monthly staff meeting and dinner of the Southwestern General Hospital was held Thursday, June 26, 1941, at 6:30 p. m. in the hospital auditorium.

The program:
"Intestinal Obstruction"..Dr. E. J. Cummins

MISCELLANY

VITAMIN C COST

Since a number of investigators have tentatively assumed that 50 mg. of vitamin C represents the normal daily human requirement, the cost of vitamin C from the fresh and canned fruit and vegetable juices has been estimated on that basis. The average amounts of juices required to supply 50 mg. of vitamin C, arranged in ascending order, are as follows: 106 cc. of fresh grapefruit juice, 107 cc. of fresh lemon juice, 116 cc. of fresh orange juice, 125 cc. of canned orange juice, 151 cc. of canned lemon juice, 167 cc. of canned grapefruit juie, 368 cc. of canned tomato juice and 568 cc. of canned pineapple juice. The average amounts of vitamin C per 100 cc. were found to be 48 mg. for the fresh grapefruit juice, 47 mg. for fresh lemon juice, 45 mg. for fresh orange juice, 41 mg. for canned orange juice, 36 mg. for canned lemon juice, 31 mg. for canned grapefruit juice, 14 mg. for canned tomato juice and 9 mg. for canned pineapple juice.

The average cost of 50 mg. of vitamin C from the various sources under consideration was found to be 2.7 cents for canned orange juice, 3.1 cents for canned grapefruit juice, 3.7 cents for fresh orange juice, 4.6 cents for fresh grapefruit juice, 6.3 cents for canned tomato juice, 7.0 cents for fresh lemon juice, 8.6 cents for canned lemon juice and 13.0 cents for canned pineapple juice.

Since vitamin C is stored in the body for only short periods of time, a constant supply is necessary for the promotion of good health. In this study the average cost per year for a daily supply of 50 mg. of vitamin C from the various sources under consideration has been calculated as $9.86 for canned orange juice, $11.32 for canned grapefruit juice, $13.51 for fresh

orange juice, $16.79 for fresh grapefruit juice, $23.00 for canned tomato juice, $25.55 for fresh lemon juice, $31.39 for canned lemon juice and $47.45 for canned pineapple juice.—*N. E. J. of Med.*

THE OSTEOPATHS

Two years ago the legislature of the State of Kansas ordered a committee to investigate the Kirksville College of Osteopathy and Surgery. The committee's report, dated Feb. 17, 1939, in part was as follows:

1. Concerning the ownership and control of the college, no information was furnished.

2. Concerning the financial resources of the college, no information was furnished.

3. Concerning the faculty, we were told by the dean that there were about 25 full-time salaried teachers and about 25 other part-time teachers.

Of the preclinical sciences, there are 5 which are taught at Kirksville and also in all recognized medical schools. These 5 subjects are anatomy, bacteriology, biochemistry, physiology, and pathology. Using the catalogue figures for student enrollment in the freshman and sophomore years, it is found that the ratio of teachers to students in these 5 departments is 1 to 75. At the University of Kansas the corresponding ratio is 1 to 4.2 and at the University of Illinois 1 to 3.8.

The lack of numbers is no more significant than the lack of training of the faculty. Of the 7 engaged in teaching the preclinical subjects mentioned above, no one has had the kind of training which would be required in any reputable medical school.

Neither medicine, osteopathy, nor any other form of healing can be learned without continuous observation of the sick. The adequacy, therefore, of clinical facilities constitutes one of the most important criteria for measuring the efficacy of any teaching program having to do with the diagnosis and treatment of disease.

The Kirksville school maintains a hospital which is said to contain 60 beds. The Laughlin Hospital, across the street, is a private institution and cannot be counted as a part of the teaching resources of the school.

The student enrollment in the junior and senior years at Kirksville is approximately 300, so that the number of hospital patients available for purposes of instruction is approximately one-fifth of a patient per student.

At the University of Kansas there are 700 patients under the control of the medical faculty and 40 students enrolled in the third and fourth years.

At Kirksville it was stated that during the year there were 170 deliveries, an average of 1.2 per cent per senior student.

According to the class schedule for the current semester, a very large part of the students' time is taken up with didactic instruction and a very small time devoted to laboratory work. This is contrary to the universally recognized principles of scientific instruction.

We saw no evidence of any investigative work being conducted by members of the faculty nor any place where such work could be carried on. We were told that there was no animal house and that no animals were kept by the school except the frogs which were used in the department of physiology; that, when needed, "a dog was brought in from the outside." It is impossible to conceive how pathology and bacteriology can be taught without the use of such animals as rabbits and guinea pigs.

Students do not supply themselves with microscopes. They are furnished by the school. Since we were told that the school owns 175 microscopes, it is obvious that each student could not have one for his personal use. In the laboratory of pathology, we were told that the microscopes were locked up in a closet and we were unable to see them.—*Federation Bulletin.*

ANEMIA DIAGNOSIS

The diagnostic plan is made up of three steps, which must be followed in order.

1. The degree of anemia must be determined by red blood cell count and hemoglobin estimation.

2. The state of balance between production and destruction of red blood cells is discovered by estimating the degree of each.

3. After classifying anemia as one of (a) decreased production or (b) increased destruction, special tests should be used to determine the subgrouping.

The tests of production (Step 2) are:

1. Reticulocyte count: normal, 0.5% to 2%.

2. Bone marrow differential count: normal, three or four white cells to one nucleated red cell.

3. Blood smear: presence of nucleated red cells shows increased production.

4. Uric acid: the normal ranges from 2 to 4 mg. per cent, but the value rises with increasing red cell production.

The tests for the destruction of red blood cells (Step 2) are:

1. Stool urobilinogen: normal is 100 to 500 mg. by the Sparkman quantitative method.

2. Icterus index: normal, 5 to 7; increased levels indicate increased destruction.

3. Repeated red blood cell counts. If these fall in the fact of increased production, a relatively increased destruction is indicated.

The special tests for subgrouping anemias include determination of the following:

1. Diameter of red corpuscles; normal, 6.8 to 7.8 microns.

2. Volume of red corpuscles: normal of corpuscular volume is 80 to 95; normal of volume index, calculated from hematocrit, is one.

3. Red cell thickness in relation to diameter; normal ratio, one to four.

4. Fragility test: normal span of hemolysis ranges from .042% to .038% with sodium chloride solution.

5. Morphology of red cells: a sealed wet preparation is used for sickling; a stained smear for stippling and other changes, as well as for determining abnormality of white blood cells.

Not all these tests need be employed in every case.—*Tri-State M. J.*

CONSULTANTS

Consultations for help in treatment and management have three purposes—

First, for the genuine effort to obtain help for the patient.

Second, to share the responsibility of caring for a seriously ill patient.

Third, to satisfy the patient or the friends in contact with the case.

A doctor becomes a nuisance to consultants when he gropes about cloak rooms and hallways seeking free opinions. He usually states:

"I will have you see this patient in a day or so." He seldom does. This is not of much value to the patient and certainly not profitable to the consultant. If a consultant is contacted for his help in treatment and management, he should at least be invited to visit the bedside and view the patient.

Consultants may, and do have, complexes the same as the rest of us. At times this comes to light at the bedside. The symptoms include:

a. "When I was in Vienna . . ., Mayos, or Boston . . ."

b. "My last 20 cases like this . . ."

c. "The president of First National and Senator So and So looked like this." (This is dangerous for the patient may know they both died.)

d. Gloomy seriousness of attitude such as long time inspection of patient's hands, pointing out cyanotic nails, fingering open an eye and gazing at a pupil, then putting the lid gently back in place in true mortician's manner.

e. Undue efforts to be gloriously funny in a sick room.

Here is a serious charge, but unfortunately it does occur. The consultant gradually and imperceptibly takes possession of the patient. Noah Webster calls that stealing. In such deals the consultant loses in the long run; any general practitioner can take care of that.

Failure to discuss the fee with the doctor before presenting a bill. A fee too little can be as damaging to the prestige of the family doctor, as when the consultant makes an obvious overcharge.

The ideal consultant in the sick room must, first of all, be informed. Then he must be human, friendly, deliberate without apparent haste, render an opinion guardedly, leave a little hope when possible, and when the business at hand is over—go.—*J. Ind. St. Med. Assoc.*

DIAGNOSIS AND CRITERION OF CURE IN GONOCOCCAL INFECTIONS

The diagnosis of gonorrhea must be made from a summation of information obtained from the history, symptomatology, physical signs, and laboratory reports. The majority of

females present themselves for diagnosis in the chronic stage of the disease.

The pertinent factors in the history are: (1) possibility of contact with infected individual. (2) The past history of urinary frequency and dysuria. (3) The past history of profuse purulent vaginal discharge. (4) Pain or discomfort in the lower abdominal quadrant.

In the symptomatology, the important factors are: (1) The presence of frequency, especially nocturia, and pain on urination. (2) The presence of vaginal discharge. (3) Pain in the lower abdominal quadrant may or may not be present.

The physical signs which should be sought are: (1)Purulent discharge from the urethra. (2) Purulent discharge from Skene's glands. (3) Thickening along the length of the uretha. (4) Redness around the orifice of Bartholin's glands. (5) Redness or swelling in Bartholin's gland. (6) Expression of pus from the orifice of Bartholin's gland. (7) Purulent discharge from the external cervicalos. (8) Hypertrophy and edema of the cervix. (9) Erosion of the cervix. (10) Presence of nabothian follicle cysts. (11) Thickening and tenderness in the parametrial tissues, especially posteriorly and laterally. (12) Thickening and tenderness in the adnexa. (13) Pelvic cellular inflammation. (14) Pelvic peritoneal inflammation.

Laboratory assistance should be obtained as follows: (1) Positive Gram negative intra or extracellular dipplococci in the smear from the secretions of the urethra, cervix or Bartholin's glands. (2) Positive culture for gonococci from the urethra, cervix or Bartholin's gland.

The criteria of cure primarily demands an absence of all symptoms and physical signs. In the male, subsequent smear and culture from the urethra and the prostate with or without the use of provocatives should be negative. These examinations should be repeated twice at monthly intervals. In the adult female, smears and cultures from the urethra and cervix for six successive weeks and thereafter for six additional smears and cultures at bi-weekly intervals must all be negative. In the female child, six smears and cultures from the vagina, cervix and rectum, taken at weekly intervals, should be negative. This series should be repeated twice with a lapse of one month between each series.—*Jo. M. S. M. S.*

LEUKEMIA

Leukemia was recognized by both J. H. Bennett and Virchow in 1845. The depth of perception displayed by these investigators in associating enlargement of the spleen with increase in the white cells of the blood is appreciated when one recalls that their publications antedated by 30 years the introduction of methods for counting and differentially staining the white cells. Bennett referred to the blood alteration as "suppuration of the blood"; Virchow called it "white blood." Twenty years later, in 1865, Cohnheim reported, under the name of pseudoleukemia, a case having the clinical and postmortem features of leukemia in which the white corpuscles of the blood showed "no deviation from the normal." In 1870 Neumann recognized the importance of the bone marrow changes in leukemia, and by the end of that decade the technic of the enumeration of the various blood cells had been introduced and was being applied to the blood dyscrasias. During the ensuing 30 years, a number of cases of leukemia having normal or subnormal leukocyte counts were reported under a variety of names so great as to lend confusion to the literature of the entire subject.

The designation "aleukemic leukemia" for this condition is attributed to Orth by H. Hirschfeld and to Pappenheim by H. Baar. The behavior of leukemias could be, according to Turck, either (1) leukemic, (2) subleukemic, or (3) aleukemic, the latter group being the same as Cohnheim's pseudoleukemia. Here we can pause to consider the fate of the word pseudoleukemia. It was soon applied to nonleukemic diseases such as Hodgkin's, in which the clinical picture suggested leukemia (H. Senator). Today, no longer used for leukemia in a specific sense (although O. Naegeli does give it such a generic meaning when he groups under it aleukemic leukemia, leukosarcoma, and certain specific granulomas), pseudoleukemia now designates a variety of blood pictures which, while suggesting leukemia, are found to belong to some other nonleukemic disease.

Following is an incomplete list of names used by various authors in reporting cases of aleukemic leukemia. It shows at a glance the confusion, lack of conformity, and historic evolution of its designations.

Pseudoleukemia	Cohnheim	1865
Anaemica splenica pseudoleucaemia	G. Jawein	1897
Leukanaemia	W. von Leube	1902
	F. G. Bushnell and D. G. Hall	1906

"DON'T SMOKE" is advice hard for patients to swallow. May we suggest "SMOKE PHILIP MORRIS" instead? Tests showed 3 out of every 4 cases of smokers' cough cleared on changing to Philip Morris. *May we send you the studies themselves?*

PHILIP MORRIS & CO. LTD., INC., 119 FIFTH AVENUE, NEW YORK

Please send me copies of the reprints checked.

☐ Proc. Soc. Exp. Biol. and Md., 1934, 32, 241-245—"Pharmacology of Inflammation: III. Influence of Hygroscopic Agents on Irritation From Cigarette Smoke."

☐ N. Y. State Jour. Med. 1935, 35-No. 11,590—"Irritating Properties of Cigarette Smoke as Influenced by Hygroscopic Agents."

☐ Laryngoscope, 1935, XLV, No. 2, 149-154—"Some Clinical Observations on the Influence of Certain Hygroscopic Agents in Cigarettes."

☐ Laryngoscope, 1937, XLVII, 58-60—"Further Clinical Observations on the Influence of Hygroscopic Agents in Cigarettes."

NAME _____

ADDRESS _____

CITY _____ STATE _____

AMA

Myeloid pseudoleukemia	H. Hirschfeld	1908
Aleukemic leukemia	Orth	
	Pappenheim	
	Hirschfeld	1914
Aleucocythaemic leukaemia	J. T. King	1917
Leukopenic leukemia	N. Rosenthal and W. Harris	1935
	F. R. Miller and W. B. Seymour	1938
	R. B. Scott	1939
Hypocytic leukemia	R. R. Kracke and H. E. Garver	1935
Subleukemic leukemia	Turck	
	E. E. Osgood	1937
	C. E. Forkner	1937
The I A B Code	V. H. Moon	1939

Hirschfeld, in 1914, after a considerable period of interest in these cases, which he called *aleukemic leukemia*, clearly defined them as clinical variants of regular leukemia in which there was no increase in the number of leukocytes in the blood.

Leukemia (white blood) has long since come to mean the disease in which the leukocyte formative tissue has undergone lawless proliferation. Nevertheless, aleukemic leukemia—White blood without white blood—presents an obvious contradiction. Attempts have been made to escape this paradoxic word combination, one of the first being by King, who called it "aleucocythaemic leukemia," a good name that was never adopted.

During the past 5 years the term aleukemic leukemia has been so tossed about on the sea of medical literature that it is no longer sure of its cargo. Its original connotation (Hirschfeld) of a leukemia in which the leukocyte count is not above normal is still maintained by many, including the able hematologist, A Piney. Another large group, numbering Kracke, Forkner, and Osgood, follow R. H. Jaffe's thought that "aleukemic" should be reserved for those cases which in addition, never show a diagnostically significant number of immature cells in the blood. These cases are rare.

After all, whether a case is diagnosed as aleukemic, subleukemic, or simply leukemic depends in a great degree on the length of time the case can be observed. Many cases, first seen in the aleukemic or subleukemic phase, will ultimately be diagnosable as leukemia from study of the peripheral blood. With this in mind, and considering that clinical diagnosis is the important reason for recognizing the aleukemic phases, we feel that it is permissible to use aleukemic leukemia in a generic sense to embrace all of these manifestations.

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1. Knight, F., and Shelanski, H. A., "Treatment of Acute Anterior Urethritis with Silver Picrate," Am. J. Syph., Gon. & Ven. Dis., 23, 201 (March), 1939.

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BOOK NOTES

A PRIMER FOR DIABETIC PATIENTS: Russell M. Wilder, M. D., Ph. D., F. A. C. P. Professor and Chief of the department of Medicine of the Mayo Foundation, University of Minnesota; Head of Section on Metabolism Therapy, Division of Medicine, the Mayo Clinic. Seventh Edition Reset. 166 pp. with diet charts and illustrations. W. B. Saunders Company. $1.75.

Even with the advent of protamine-zinc insulin, the long sought, single preparation injection method of treatment still has not been satisfactorily achieved. The foregoing is the basis for which this seventh edition of the diabetic patients' "bible" is presented. This latest edition advocates a fortunate medium in combining the use of both plain insulin combined with protamine-zinc insulin. Since Dr. Wilder's Primer has been published for twenty years, little more testimonial is required to prove its worthiness.—*V. M. R.*

X-RAY THERAPY OF CHRONIC ARTHRITIS (Including X-Ray Diagnosis of the Disease). Preliminary report based on 100 patients treated at Quincy, Ill.: Karl Goldhamer, M. D. Associate Roentgenologist, St. Mary's Hospital and Quincy X-Ray and Radium Laboratories; formerly Roentgenologist, University of Vienna; Honorary Member, Mississippi Valley Medical Society; etc. With a Foreword by Harold Swanberg, B. S., M. D., F. A. C. P. Editor, Mississippi Valley Medical Journal and the Radiologic Review. Roentgenologist, St. Mary's Hospital and Blessing Hospital, Director, Quincy X-Ray and Radium Laboratory, Past President, Illinois Radiological Society, etc. 131 pp. with numerous illustrations, two roentgenograms, and four tables. Radiologic Review Publishing Co., Quincy, Illinois. First Edition. $2.00.

The author presents a review consisting of the clinical aspects and pathology of chronic arthritis, the x-ray findings and differential diagnosis, what cases should be treated, the technique, and finally, a clinical report on 100 consecutive cases. While this only constitutes a preliminary report, the results (60% clinically cured or improved) certainly warrant further study and consideration of this form of treatment for arthritis. The author does not claim that x-ray treatment is specific; his results, in many instances, are very successful. However, he advocates the use, in conjunction with x-ray, of most accepted forms of therapy. This makes a proper evaluation of his results somewhat confusing since he does not give us the details of complementary therapy.—*V. M. R.*

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TEXTBOOK OF PEDIATRICS: By J. P. Crozer Griffith, M. D., Ph. D., Emeritus Professor of Pediatrics in the Univ. of Pennsylvania; Consulting Physician to the Children's Hospital, Philadelphia; Consulting Physician to St. Christopher's Hospital for Children; Consulting Pediatrist to the Woman's, the Jewish, and the Misericordia Hospitals, etc.; and A. Graeme Mitchell, M. D., B. K. Rachford Professor of Pediatrics, College of Medicine, University of Cincinnati; Medical Director and Chief of Staff of the Children's Hospital of Cincinnati; Director of the Children's Hospital Research Foundation; Director of Pediatric and Contagious Services in the Cincinnati General Hospital. Third Edition, Revised and Reset. 991 pages with 220 illustrations. Philadelphia and London: W. B. Saunders Company 1941. Price $10.00.

The third edition of this splendidly complete text book is the monument to Dr. Mitchell, who recently passed on after years of devoted service to his profession.

The title has been changed from "Diseases of Infants and Children" to the present "Textbook of Pediatrics." The change is apt, because pediatrics has come to deal not only with disease of the young, but with normal development, growth and behavior. The book has been completely revised and rewritten. The authors were assisted by a large group of authorities in the various divisions of medical science.

The work is divided into 2 broad parts. The first division concerns such topics as Physical Growth and Development, Hygiene, Mental and Emotional Development and Mental Hygiene, Feeding, Characteristics of Disease in Infancy and Childhood, Therapeutics and an interesting chapter on Pediatric Institutions and Organizations. The second division contains 12 sections. Each section is divided into chapters concerning the diseases of the various systems. So convenient is this arrangement that in passing a cheer should be given.

The book is packed with knowledge of the latest approved aspects of pediatric practice. It is not padded with lengthy bibliography. The authorities who aided in the writing of this volume were the ones consulted anyway, so a bibliography would be superfluous. So complete is this text that it is difficult to see just how one practicing pediatrics or general medicine can afford to be without a copy in his library.

ESSENTIALS OF ENDOCRINOLOGY by Arthur Grollman, Ph., D., M. D., associate professor of pharmacology and experimental therapeutics in the medical school of The Johns Hopkins University, formerly associate professor of physiology and

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instructor in chemistry in the same institution. Pp. 480, including index. 74 illustrations. Cloth $6.00. J. B. Lippincott Co., Philadelphia, London, Montreal.

This book is a broad review of a rapidly developing subject. Endocrinology is emerging from the realm of occultism and guess work, and is pointing the way to a more comprehensive understanding of the mechanism of the human body and man's behavior. Textbooks such as this one aid the physician greatly in his efforts to make intelligent study of this government by glands. The author sets a course marked by experimentation, and arrives at conclusions in that fashion. He points out that the maze of fanciful and ill-founded conjectures in endocrinology may be due to unwarranted acceptance of unproved assumptions as basic facts.

Divisions of the book are: Endocrine Glands of the Cranial Cavity, the Branchiogenic Organs, the Endocrine Organs of the Abdominal Cavity, the Hormones of the Reproductive System, the Hormones Derived from Non-Endocrime Organs. Included in the chapter entitled "Basic Survey" are notes on the scope and history of endocrinology, methods of administering hormones, commercially available endocrine products. A very helpful outline of endocrine products is printed just inside the covers. The book is not burdened with endless references—a device sometimes adopted to either (a) astound the reader with the author's erudition, or (b) fill up space. Some useful references are included, however. The illustrations are apropos, are well selected and splendidly reproduced.

This book condenses and makes readily available to the busy practitioner the results of years of experimentation and research in the fascinating, important field of endocrinology. It is just as essential as the dictionary to the modern physician's library.

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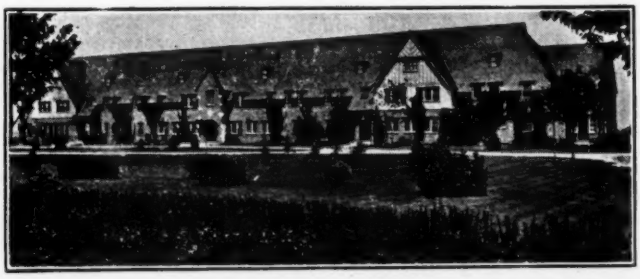

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